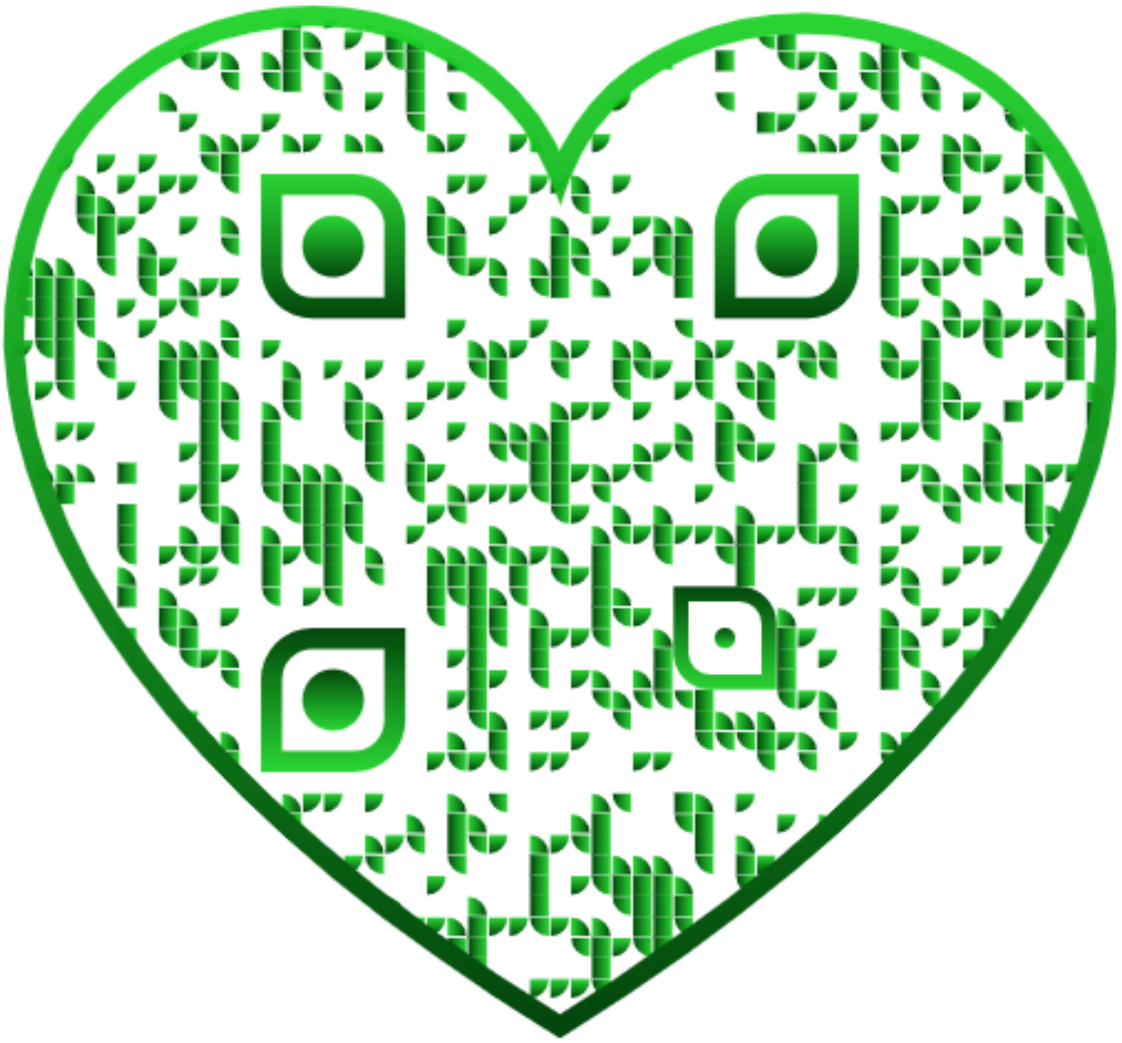
بسم الله الرحمن
الرحيم



Abdulmoghni Albarrag

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Ophthalmology Academic Staff - 2004

- Prof. Talal A Haider
- Dr Tawfik Al-Khatib
- Dr Aziz Shaher
- Dr Abdulmoghni Al-Barrag
- Dr Adnan Thabet
- Dr AbdelMageed Masood
- Dr. Mahfouth Bamashmus
- Dr. Saleh A Al-Akily
- Dr Ibrahim Al-Wazeer
- Dr Mutaher Al-Shaer
- Dr Horia Al-Ansi

Good Luck for all students

Slides Revision For Medical Students

July 2004

Ophthalmology Department
Sana'a University

Prepared by:

Prof. Talal A Haider

Dr. Mahfouth A Bamashmus

Dr. Saleh A Al-Akily

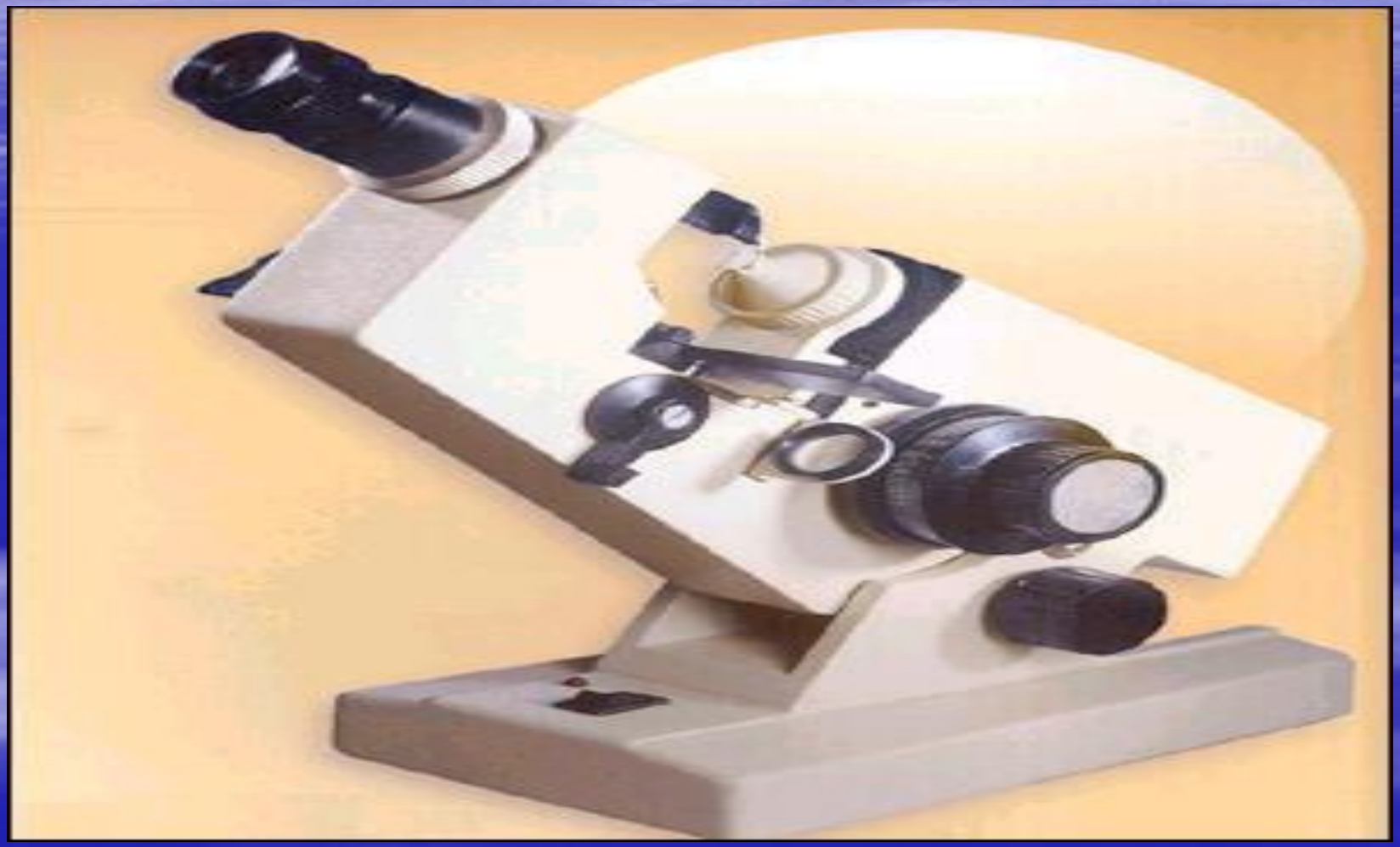
Diagnostic Instruments

Slitlamp

Lens Trial Case

Trial Frame

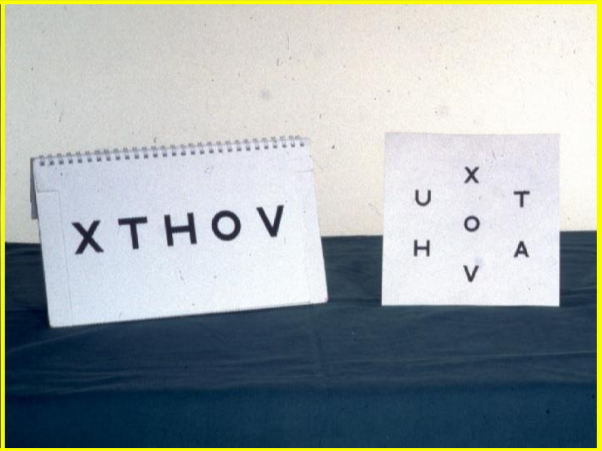
Lensemeter



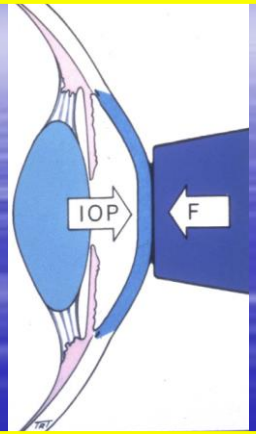
Visual acuity tests in verbal children

At age 2 years (naming pictures)

At age 3 years (matching tests)



Tonometers

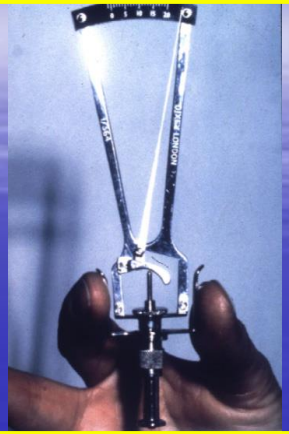


Goldmann

Contact applanation

Perkins

Portable contact applanation



Schiotz

Contact indentation

Air-puff

Non-contact indentation

Pulsair 2000 (Keeler)

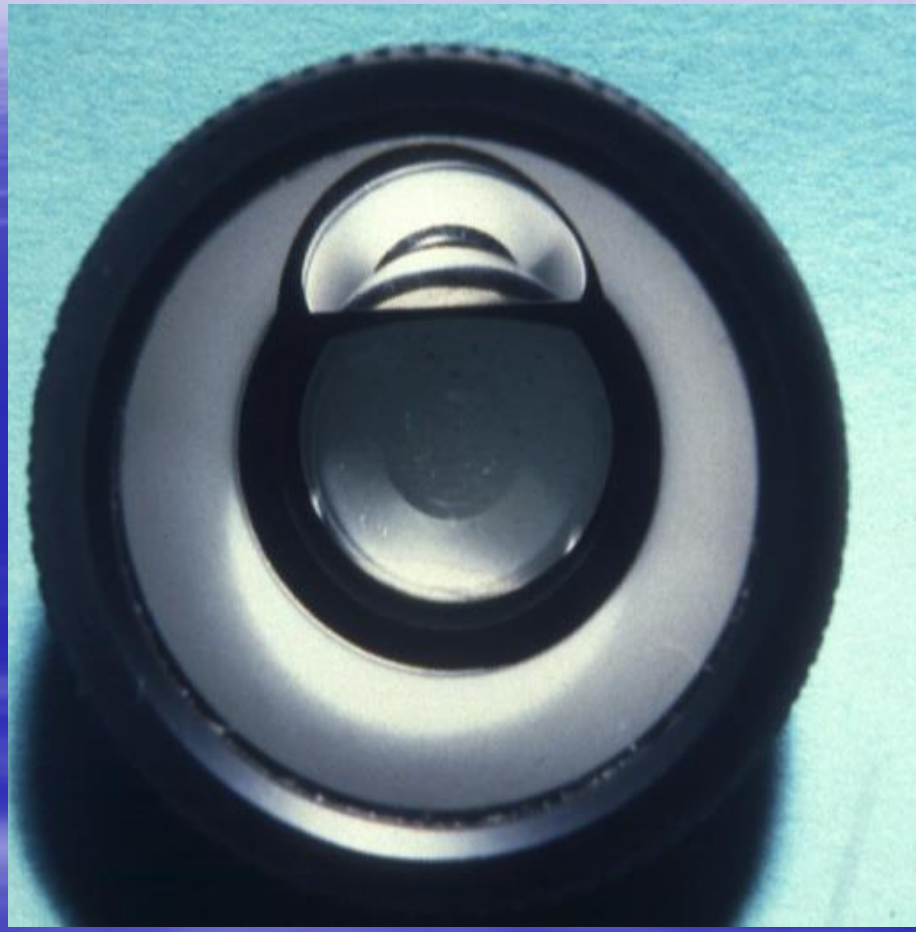
Portable non-contact applanation

Tono-Pen

Portable contact applanation

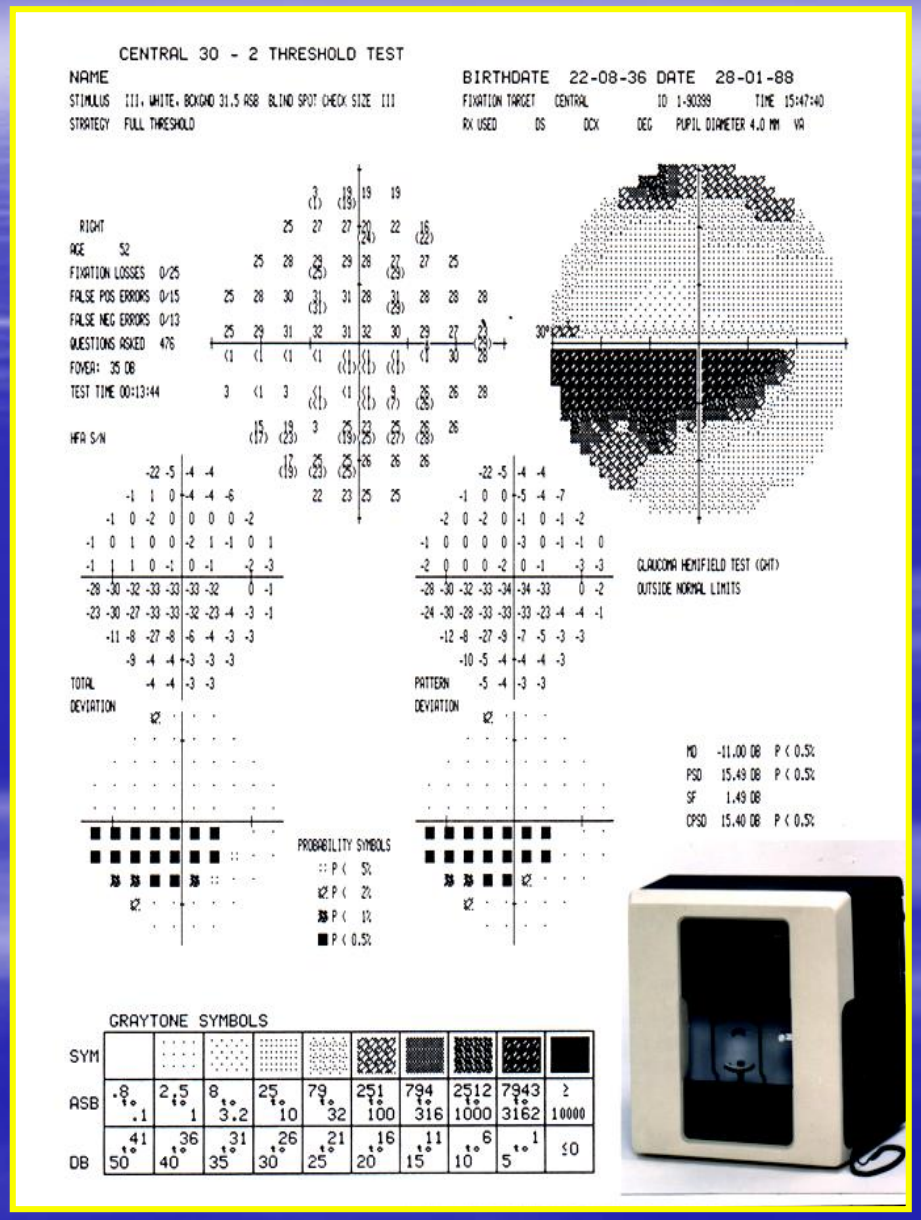
Gonioscopy

Goldmann Triple mirror



Goldmann Goniolens

Visual Field Examination



Humphrey Perimetry

Indirect Ophthalmoscopy

Fundus Photography & Flourescein Angiography

1. Take red-free photograph
2. Inject rapidly 5 ml of 10% solution
3. Take photographs at 1 sec intervals between 5-25 sec after injection

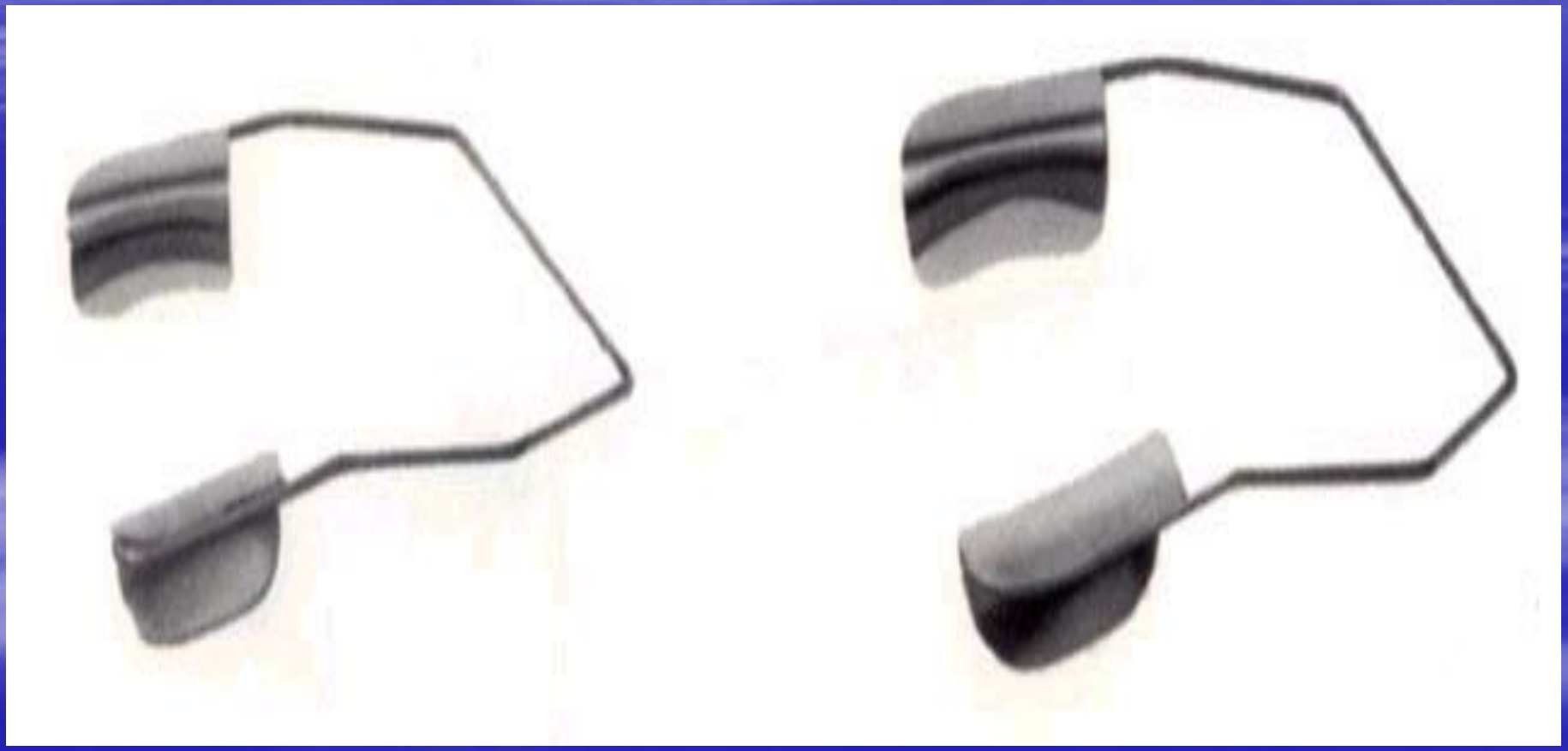
Keratometer

Surgical Loop

Surgical Instruments

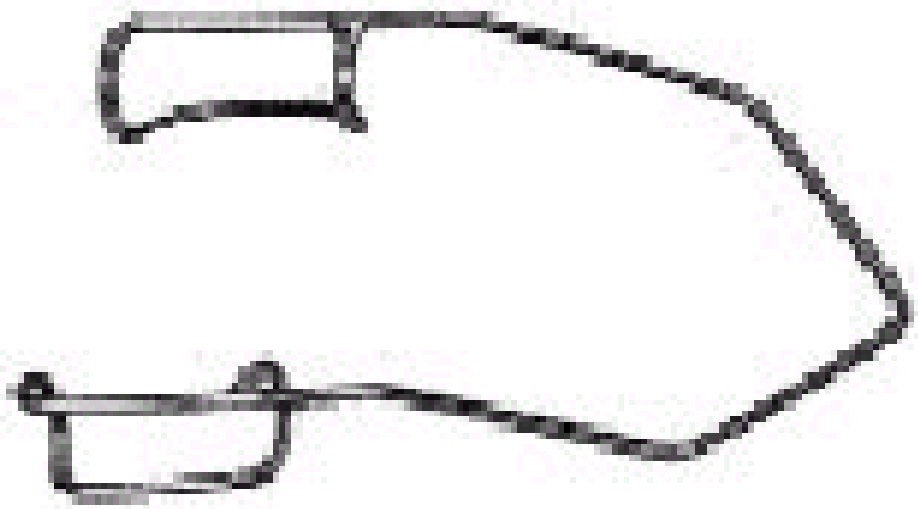
Speculum

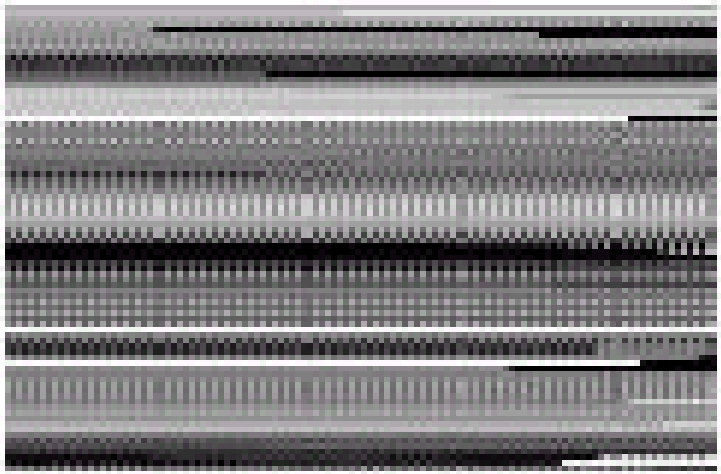
Used to retract the lids in extra-ocular operations



Speculum

Used to retract the lids in extra-ocular operations

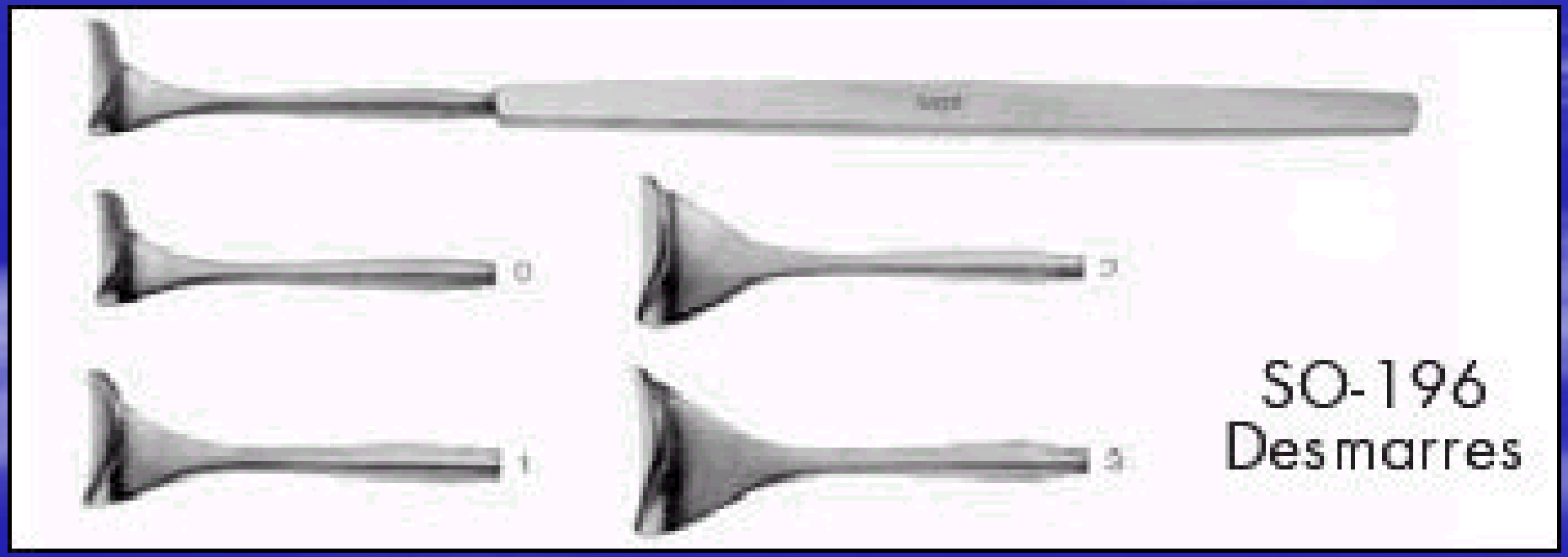




SO-187 Barraquer SO-30 Infant

Desmarre's Lid Retractor

Produces double eversion of upper lid



Lacrimal Retractor

SO-198 Cats Paw

FORCEPS

- Corneal Fixation Forceps
- St Martin Tooth Forceps
- Colibri Forceps
- Mc Pherson Tying Forceps
- Capsule Forceps
- Capsulorrhexis Forceps
- Chalazion Forceps

Corneal Fixation Forceps

SO-68 Kramer

St Martin Tooth Forceps

Colibri Forceps

SO-129-A Hoskin Colibri Forceps

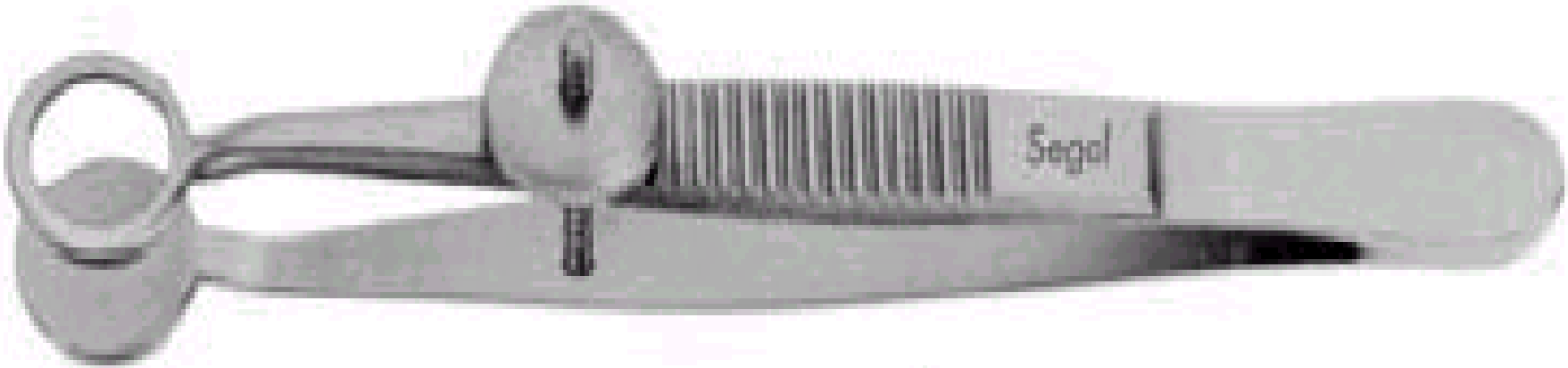
Mc Pherson Tying Forceps

SO-138 Mc Pherson Tying angled forceps

Capsule Forceps

Capsulorrhexis Forceps

Chalazion Forceps



SO-338 Lambert

Chalazion Forceps

Scissors

- Strabismus Scissors
- Enucleation Scissors
- Westcott's Corneal Scissors
- Catroviejo Corneal Scissors
- De Weckers Iris Scissors
- Vannas Scissor

Strabismus Scissors

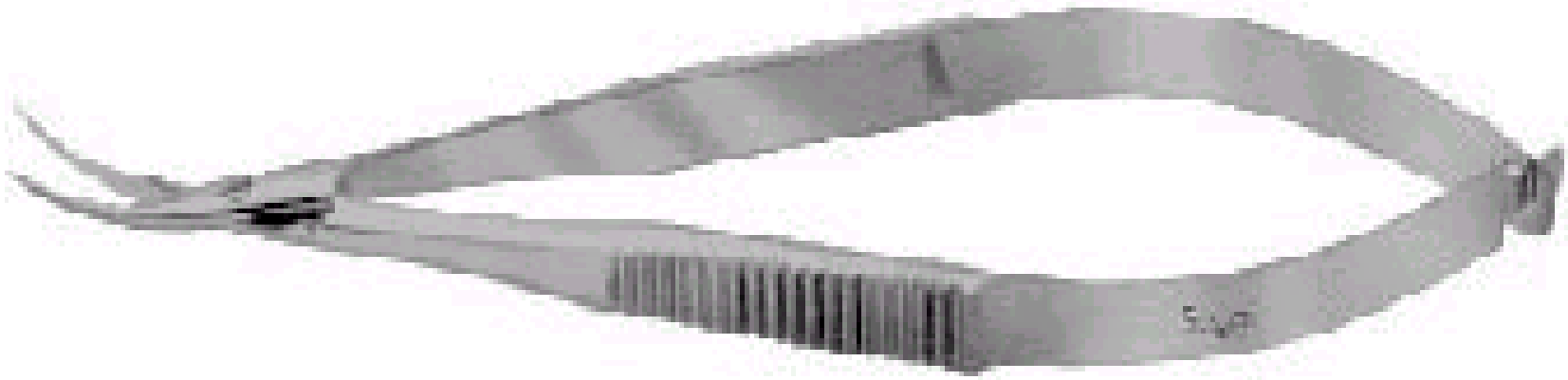
Enucleation Scissors

SO-347 Noyes Iris Scissor

Westcott's Conjunctival & Corneal Scissors

SO-354 Westcott

Catroviejo Corneal Scissors



SO-353 Castroviejo Curved Corneal Scissors

De Weckers Iris Scissors

SO-348 De Weckers

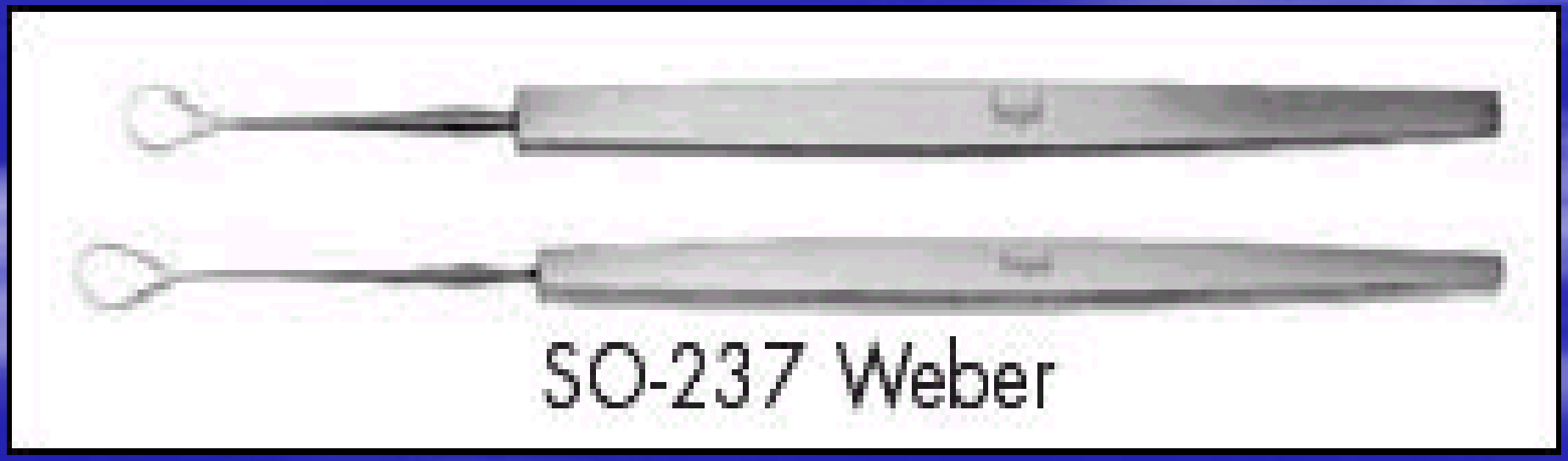
Vannas Scissor

SO-179 Vannas

Needle Holders

SO-374 Barraquer Needle Holder

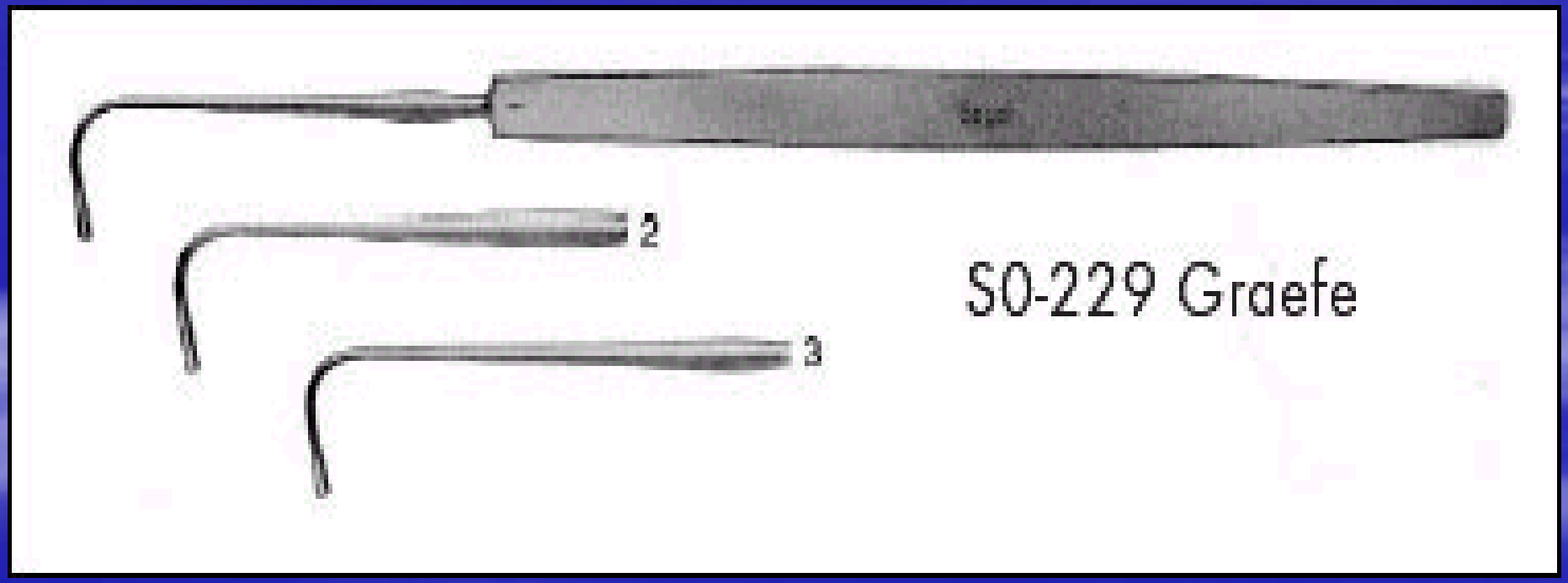
Lens Scoops



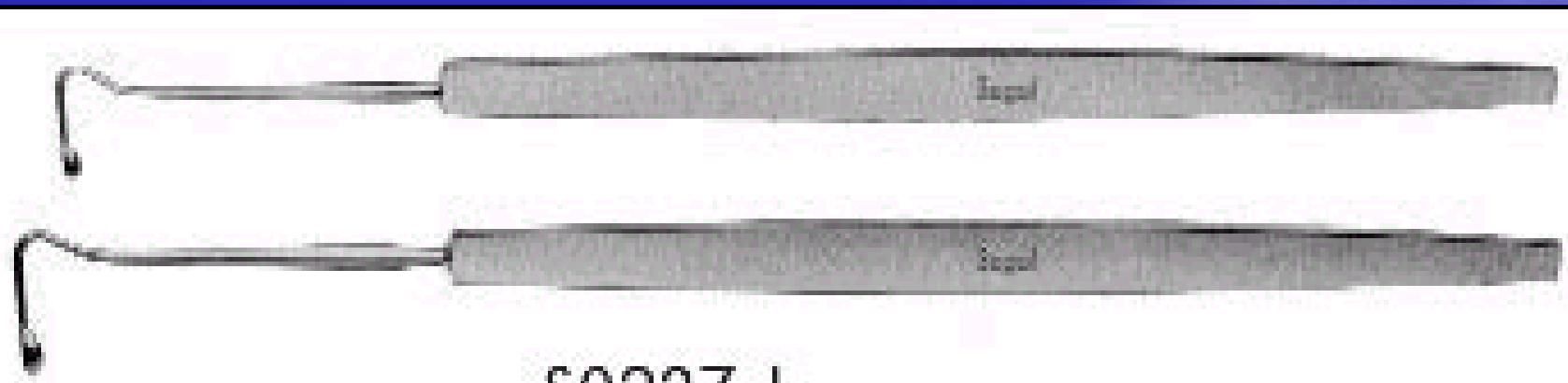
Chalazion Scoop

Calipre

Strabismus Muscle Hook



Strabismus Muscle Hook

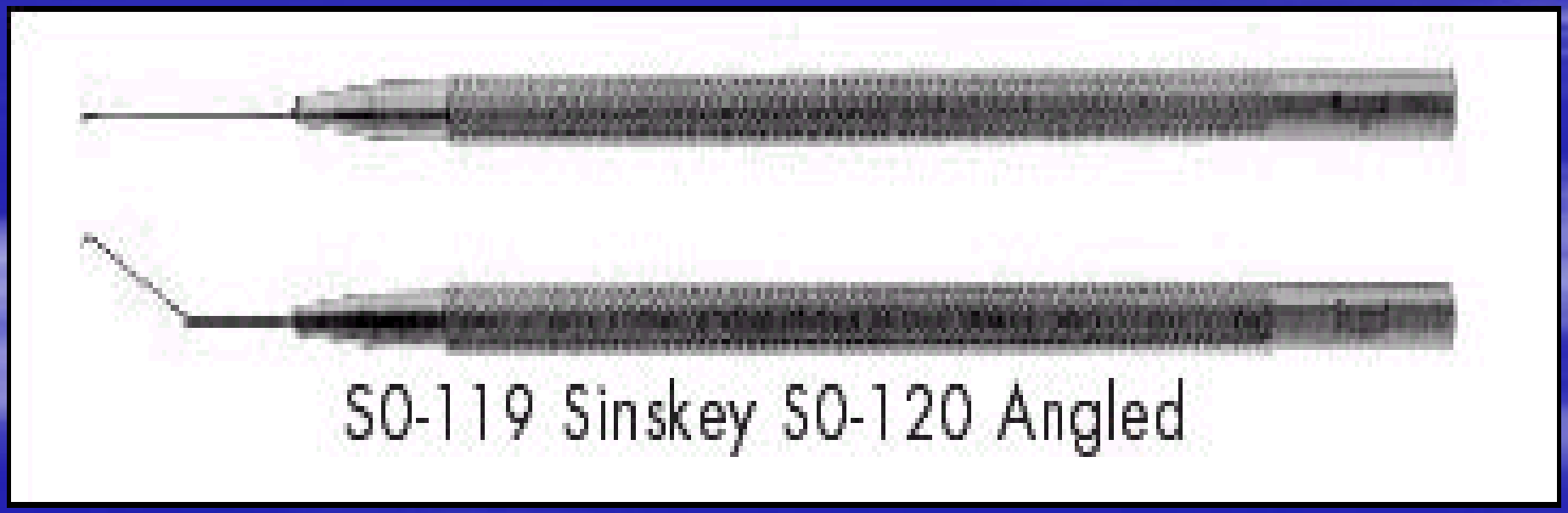


S0227 Jameson

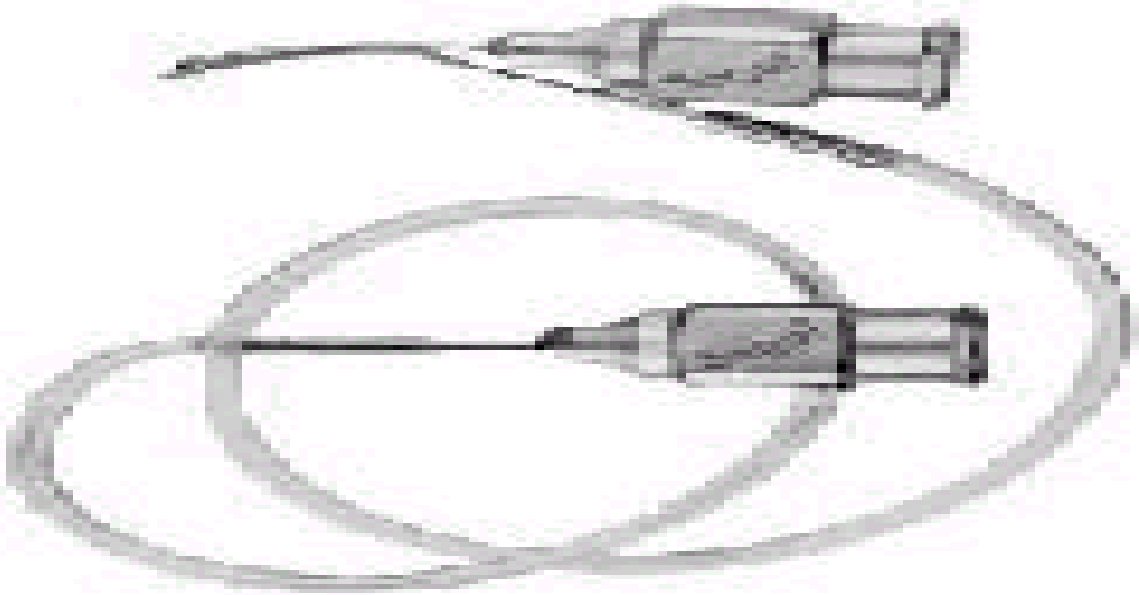
Shepard IOL Insertor

Clayman IOL Forceps

Sinskey IOL Dialer



Simcoe Irrigation/Aspiration Cannula



SO-25 Simcoe (regular)
SO-25 reversed Simcoe

Iris repositor

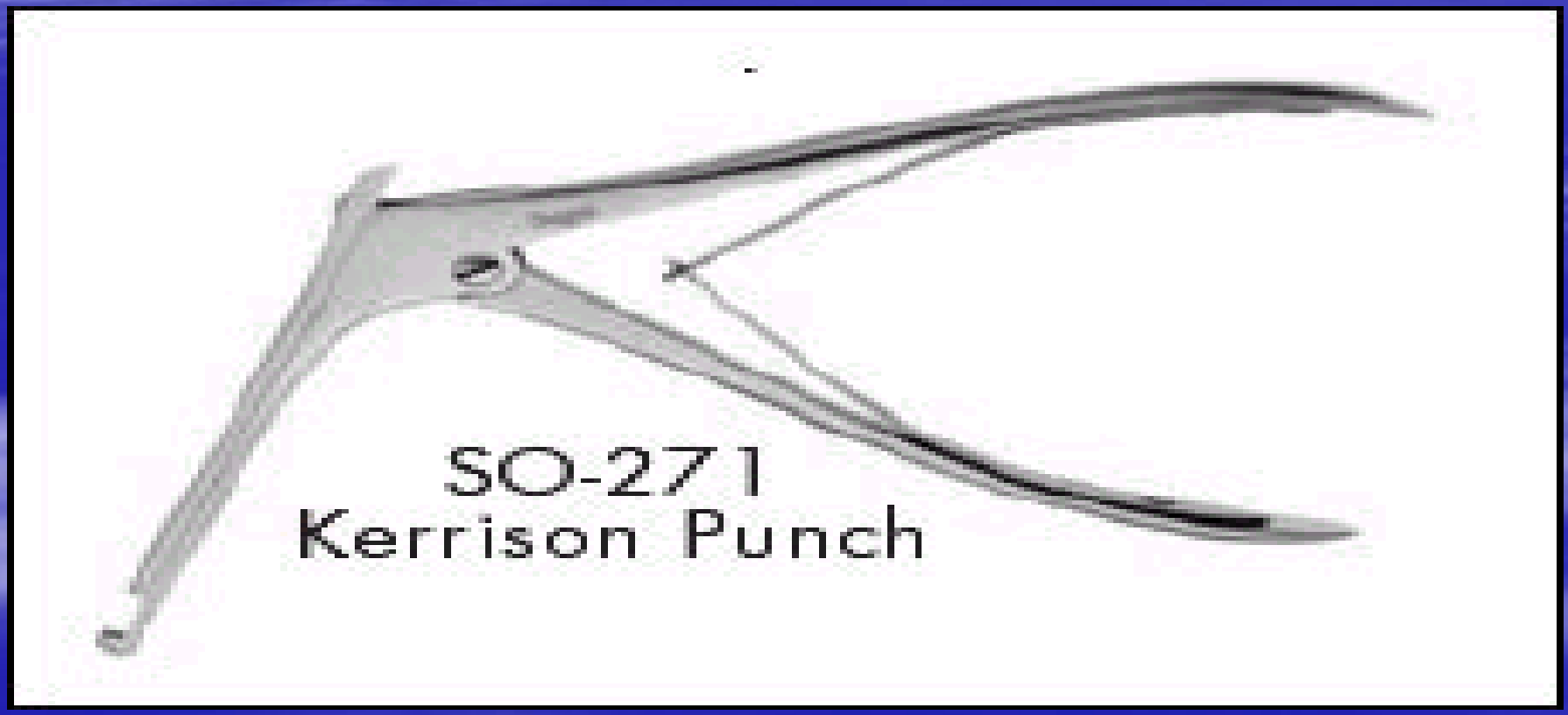
Lacrimal Cannula

Lacrimal Dilators

Lacrimal Probes

SO-266 Bowman

DCR Punch



Blade Holder

Blade Holder

SO-80 Chuck Handle

Artery Forceps

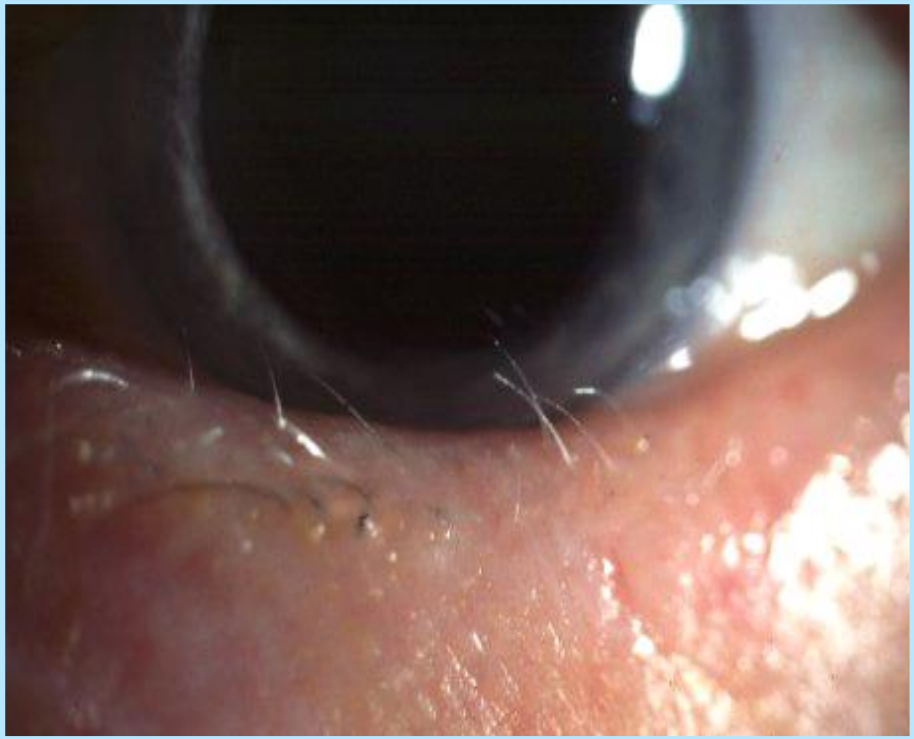
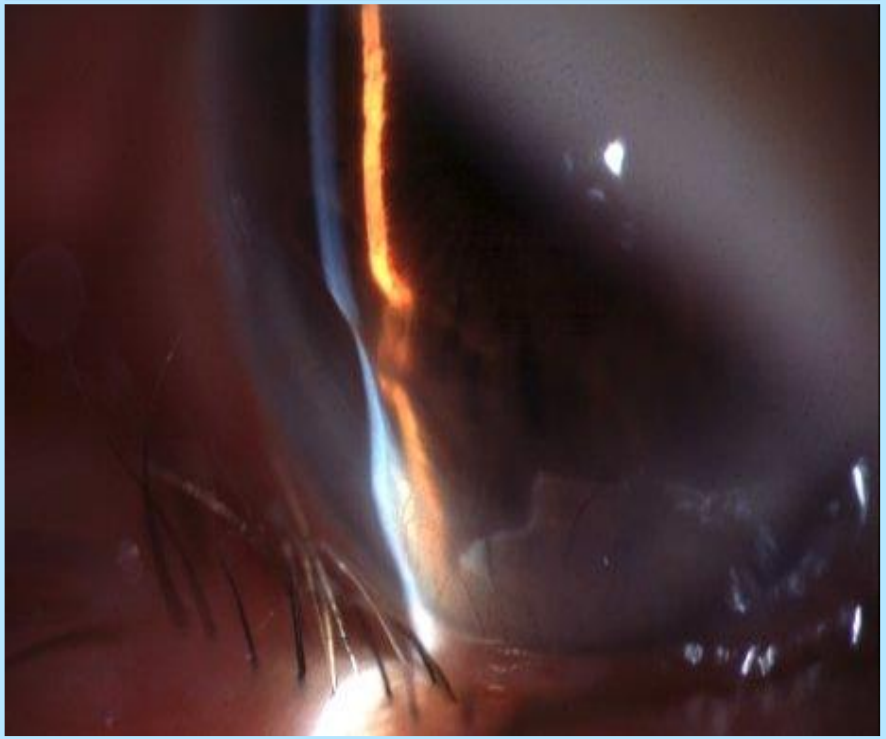
CLINICAL OPHTHALMIC SLIDES

Lid

DISORDERS OF LASHES

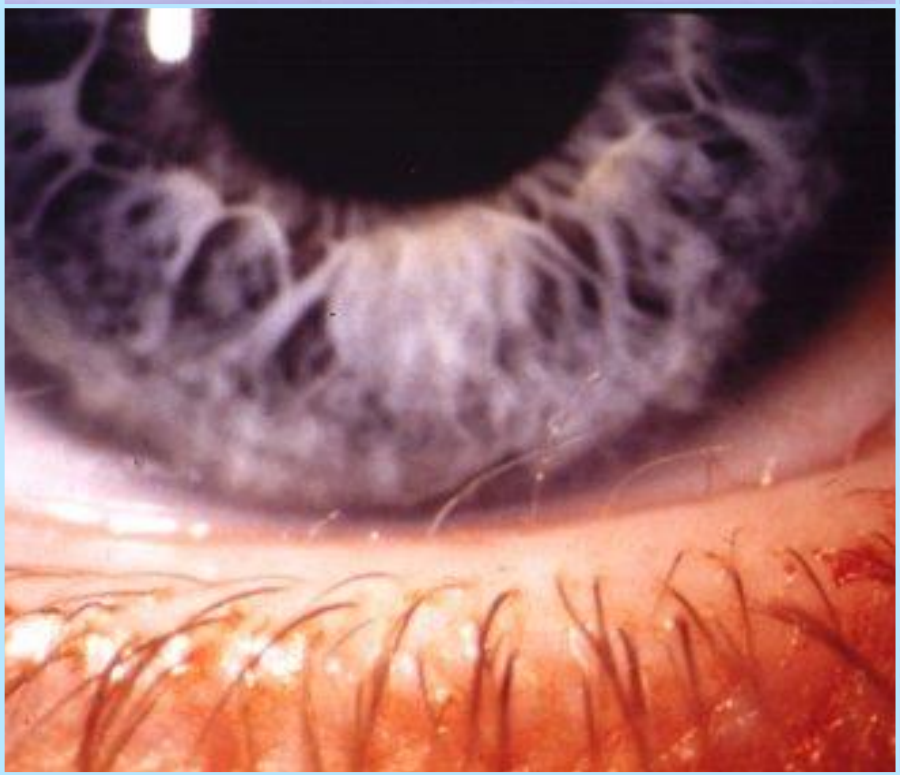
1. **Trichiasis**
2. **Distichiasis**
3. **Madarosis**
4. **Poliosis**

Trichiasis

Signs	Complications
	
• Posterior misdirection of normal lashes • Most frequently affects lower lid	• Inferior punctate epitheliopathy • Corneal ulceration and pannus

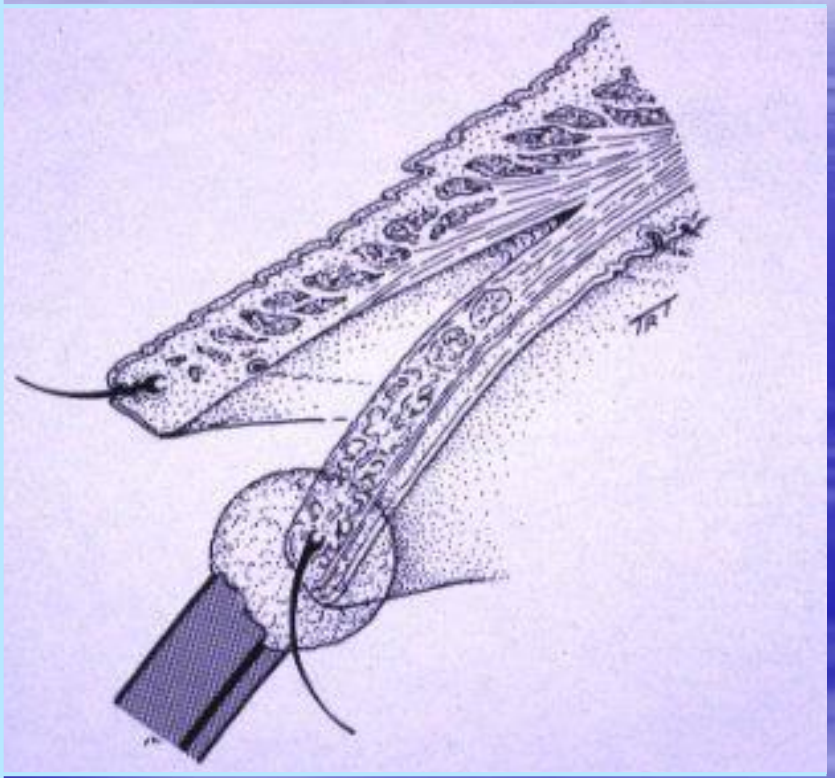
Distichiasis

Signs



- Second row of lashes arising from meibomian gland orifices
- Congenital
- Occasionally dominantly inherited

Treatment



- Division into anterior and posterior lamellae
- Cryotherapy to posterior lamella
- Reapposition of lamellae

Madarosis

Decrease in number or complete loss of lashes

Local causes

- Chronic anterior lid margin disease
- Infiltrating tumours
- Burns, radiotherapy or cryotherapy

Systemic causes

- Generalized alopecia
- Myxoedema
- SLE
- Syphilis
- Leprosy

Following removal

Poliosis

Premature localized whitening of hair

Ocular associations

- Chronic anterior blepharitis
- Sympathetic ophthalmitis

Systemic associations

- Vogt-Koyanagi-Harada syndrome
- Waardenburg syndrome

CHRONIC MARGINAL BLEPHARITIS

1. Anterior

- Staphylococcal
- Seborrhoeic

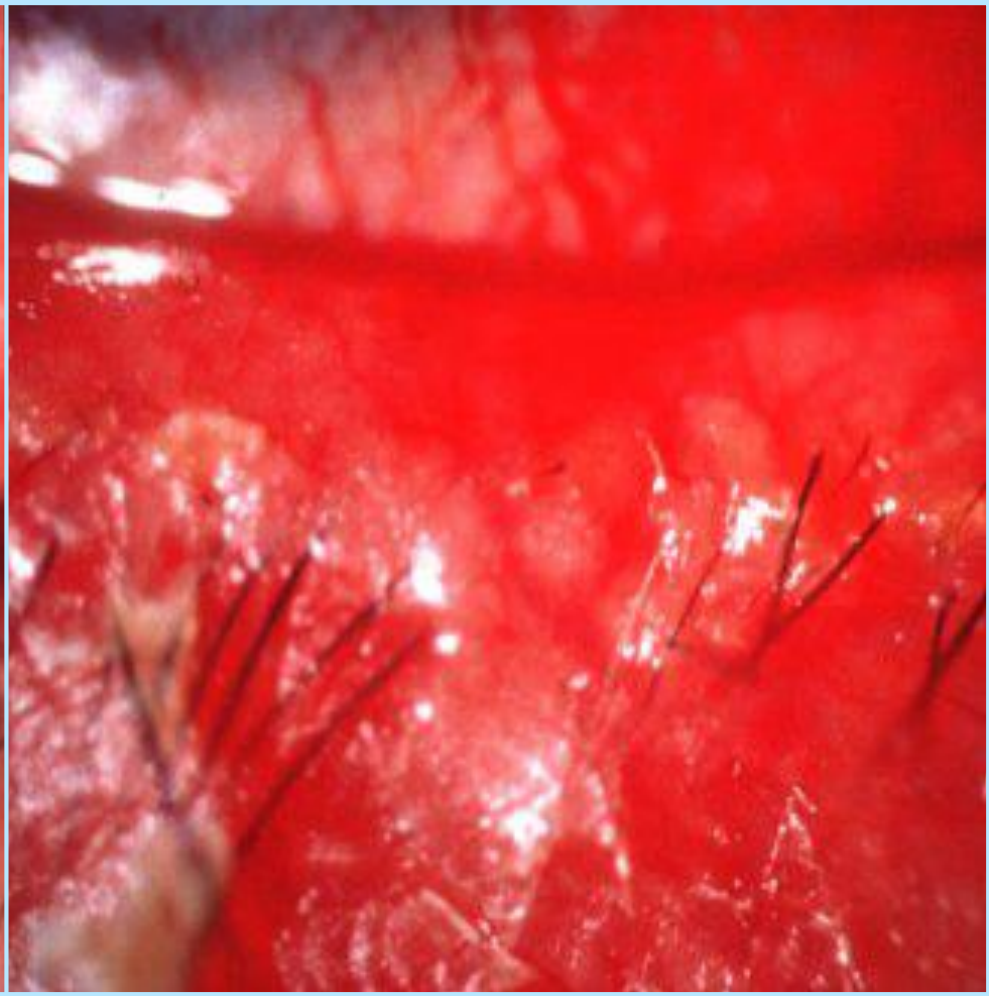
2. Posterior

- Meibomianitis
- Meibomian seborrhoea

Staphylococcal blepharitis

Chronic irritation worse in mornings

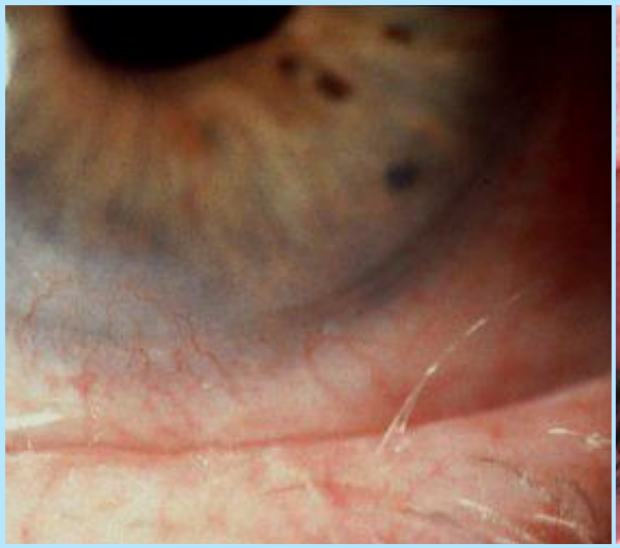
Scales around base of lashes (collarettes)



Hyperaemia and telangiectasia of anterior lid margin

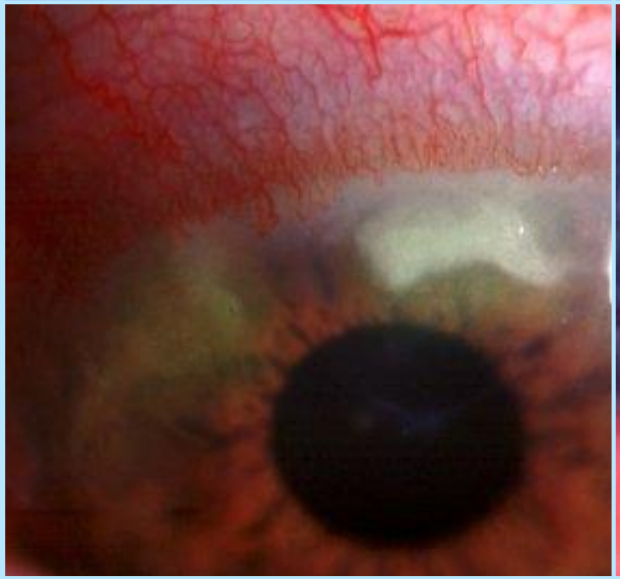
Scarring and hypertrophy if longstanding

Complications of staphylococcal blepharitis



Madarosi, Poliosis, Trichiasis

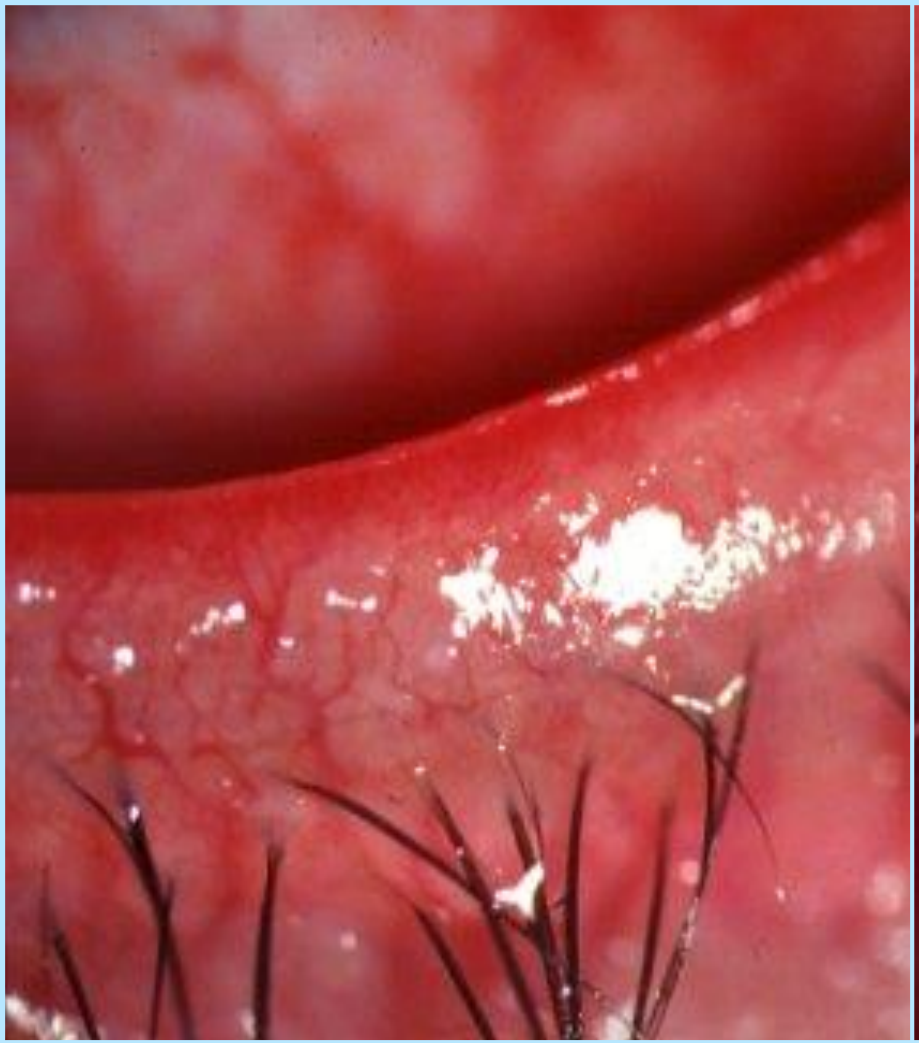
Recurrent styes



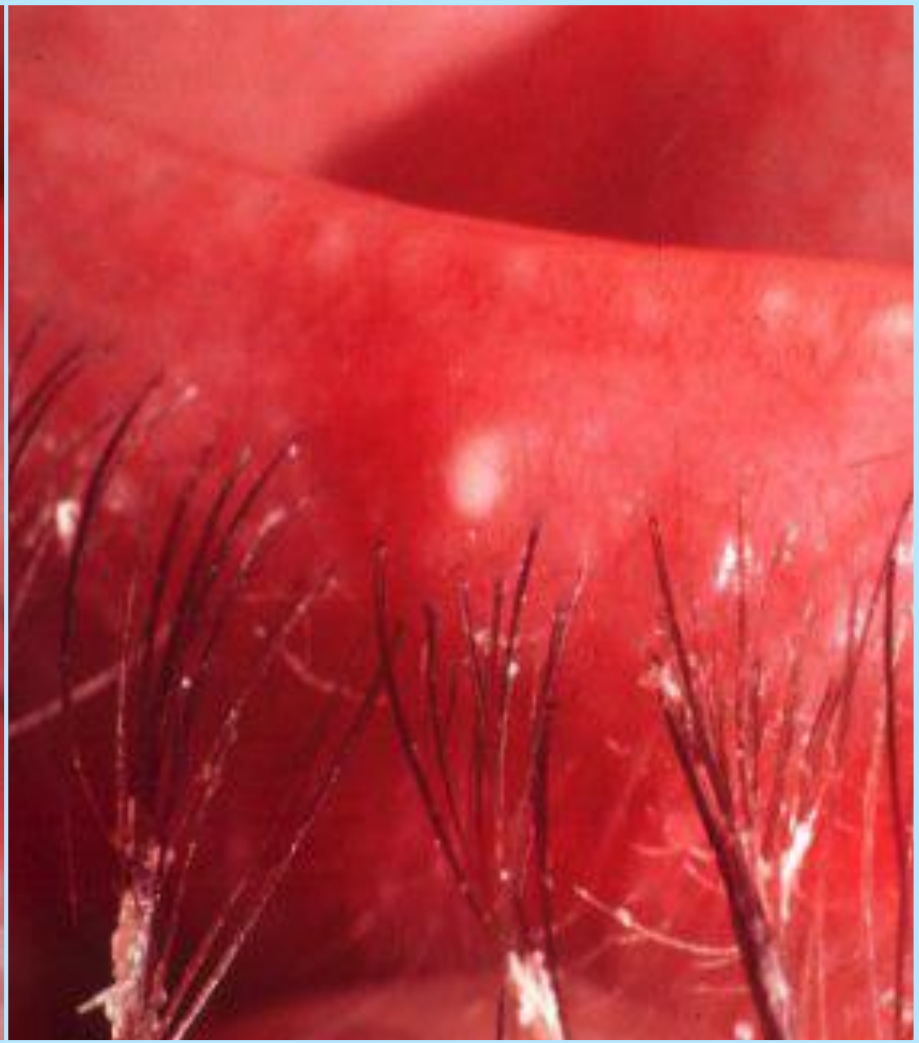
Marginal keratitis

Tear film instability

Seborrhoeic blepharitis

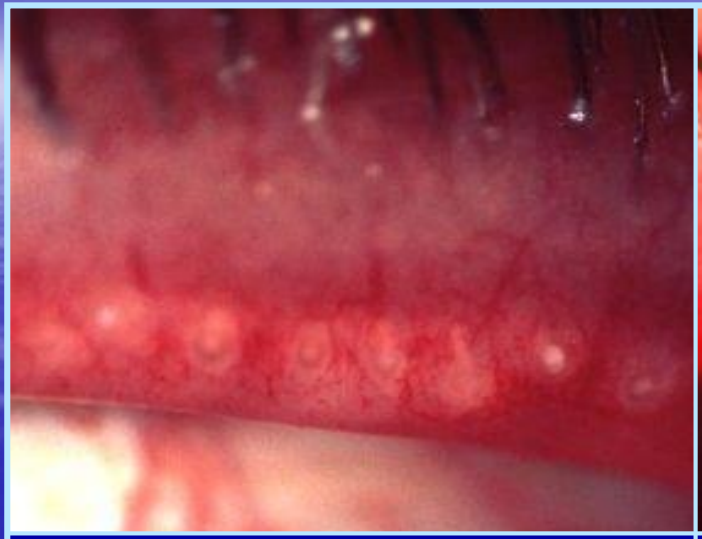


- Shiny anterior lid margin
- Hyperaemia of lid margin

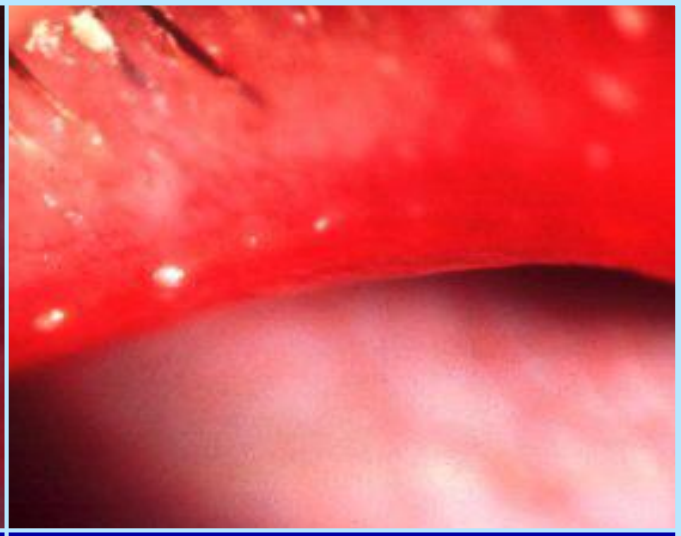


- Greasy scales
- Lashes stuck together

Meibomianitis

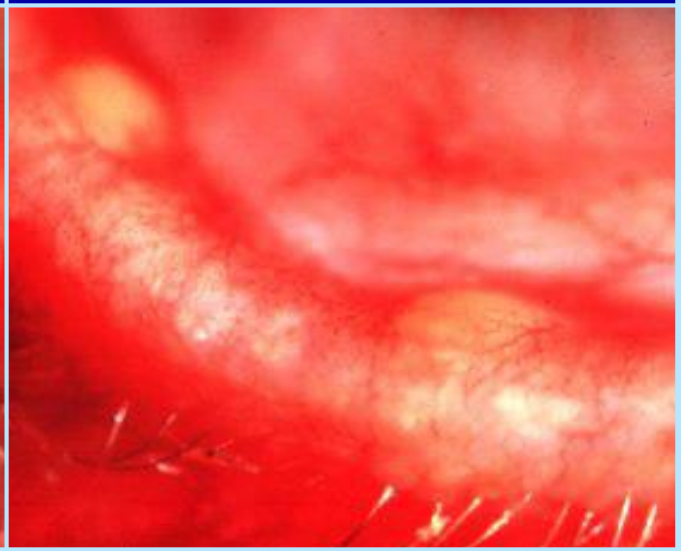


Inflamed and blocked meibomian gland orifices



Toothpaste-like plaques from meibomian glands

Thickened posterior lid margin



Meibomian cyst formation

Treatment of Chronic Blepharitis

1. **Lid hygiene** - with 25% baby shampoo
2. **Tear substitutes** - for associated tear film instability
3. **Systemic tetracyclines** - for severe posterior blepharitis
4. **Warm compresses** - to melt solidified sebum in posterior blepharitis

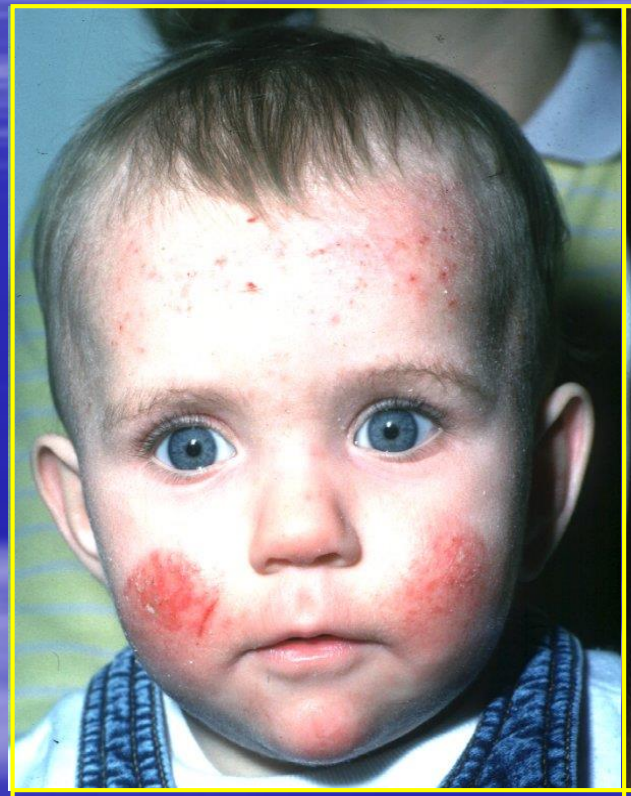
Acute allergic oedema

- Causes - insect bites, urticaria and angioedema
- Unilateral or bilateral
- Painless, red, pitting oedema
- Chemosis may be present
- Self-limiting

Atopic dermatitis

Associated with asthma and hay fever

- **Chronic itching and scratching**



Facial - in young children

Flexural - knees, elbows, wrists and ankles

Preseptal cellulitis

Causes

- Skin trauma or insect bites of lids or eyebrows
- Spread from local infection
- Upper respiratory or ear infection

Signs

- Usually unilateral
- Tender and red
- Periorbital oedema

Treatment – systemic antibiotics

Herpes simplex

Signs

- Crops of small vesicles
- Rupture and crust
- Heal without scarring after 7 days

Complications

- Follicular conjunctivitis
- Keratitis

Treatment –

Topical antivirals

Herpes zoster ophthalmicus

- Painful vesicles and pustules
- Periorbital oedema - may be bilateral

- Crusting ulceration

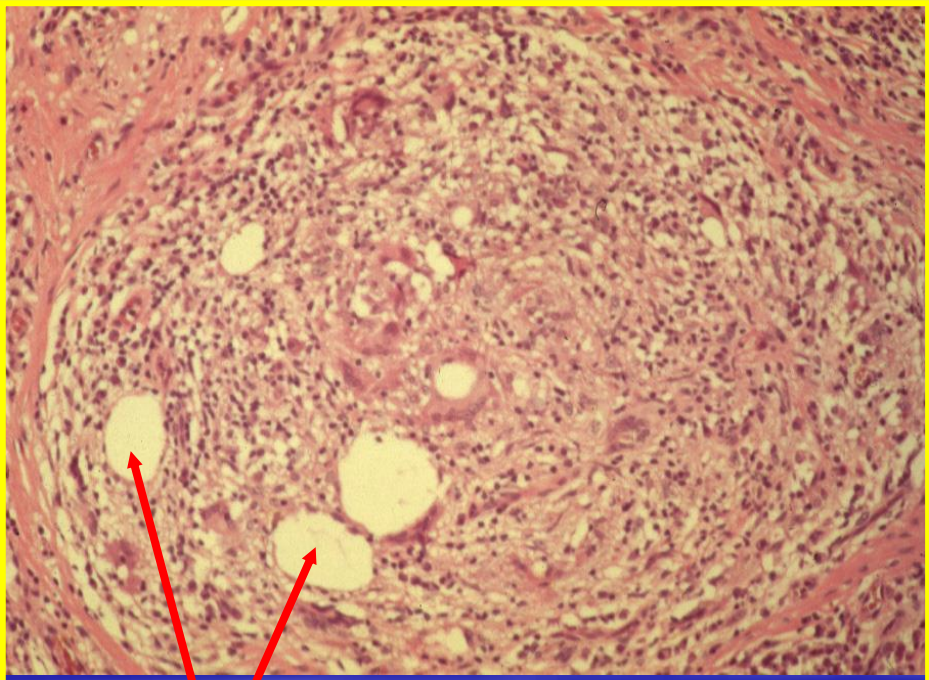
Treatment - oral antivirals

Signs of Chalazion (Meibomian cyst)

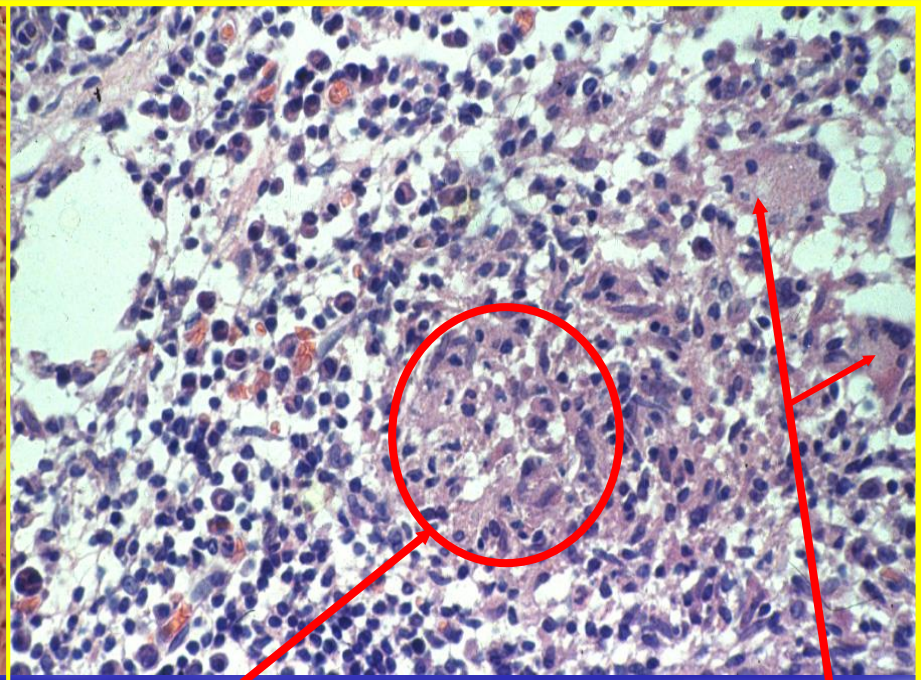
Painless, roundish, firm lesion within tarsal plate

May rupture through conjunctiva and cause granuloma

Histology of chalazion



Multiple, round spaces previously containing fat with surrounding granulomatous inflammation



Epithelioid cells

Multinucleated giant cells

Xanthelasma

- Common in elderly or those with hypercholesterolaemia
- Yellowish, subcutaneous plaques containing cholesterol and lipid
- Usually bilateral and located medially

Eyelid cysts

Cyst of Moll

- Translucent
- On anterior lid margin

Eccrine sweat gland hidrocystoma

- Similar to cyst of Moll
- Not confined to lid margin

Cyst of Zeis

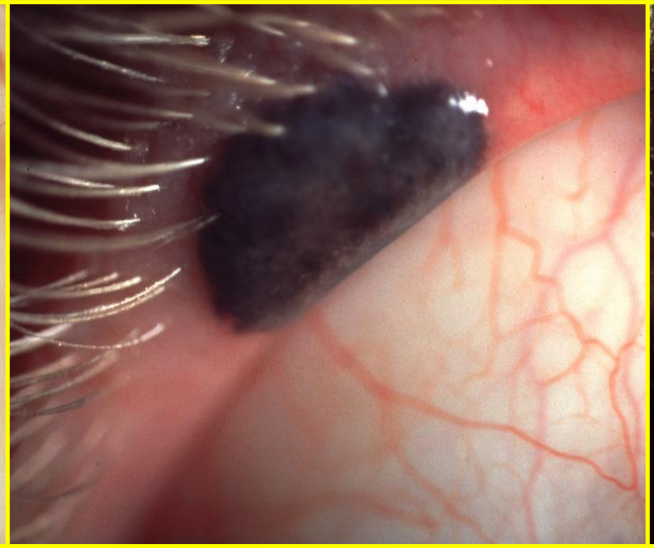
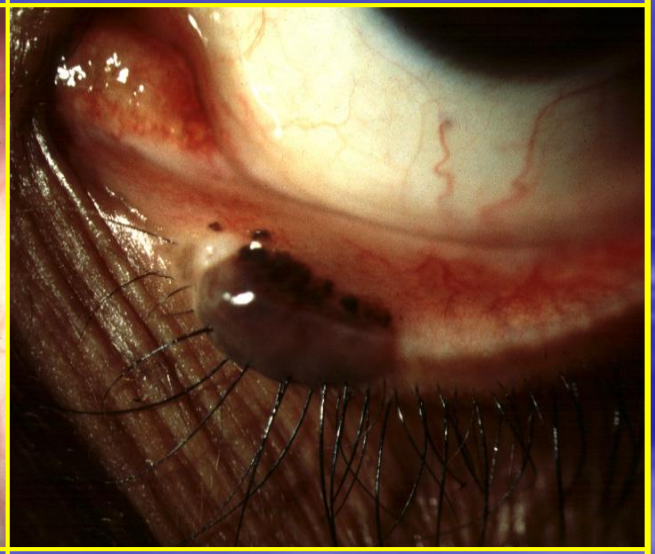
- Opaque
- On anterior lid margin

Sebaceous cyst

- Cheesy contents
- Frequently at inner canthus

Naevi

- Appearance and classification determined by location within skin
- Tend to become more pigmented at puberty

Intradermal	Junctional	Compound
		
• Elevated • May be non-pigmented • No malignant potential	• Flat, well-circumscribed • Pigmented • Low malignant potential	• Has both intradermal and junctional components

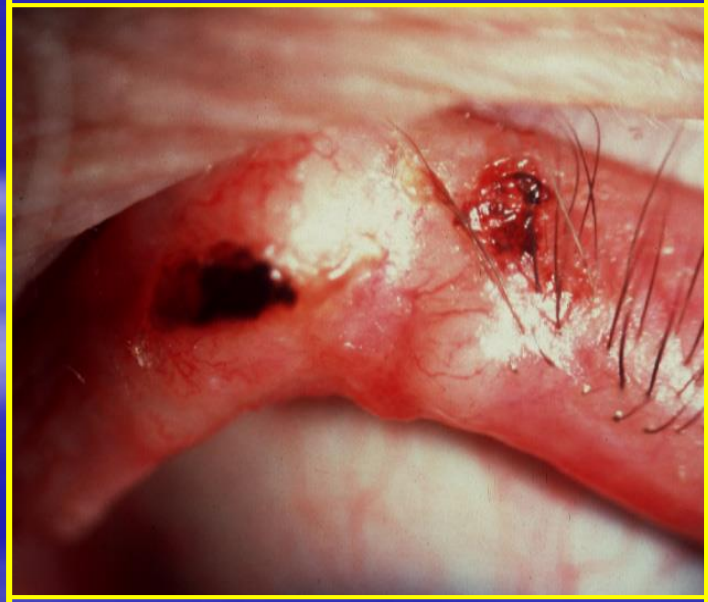
MALIGNANT EYELID TUMOURS

1. Basal cell carcinoma
2. Squamous cell carcinoma
3. Meibomian gland carcinoma
4. Melanoma
5. Kaposi sarcoma

Frequency of location of basal cell carcinoma

Lower lid - 70%

Medial canthus - 15%



Upper lid - 10%

Lateral canthus - 5%

Squamous cell carcinoma

- Less common but more aggressive than BCC
- May arise *de novo* or from actinic keratosis
- Predilection for lower lid

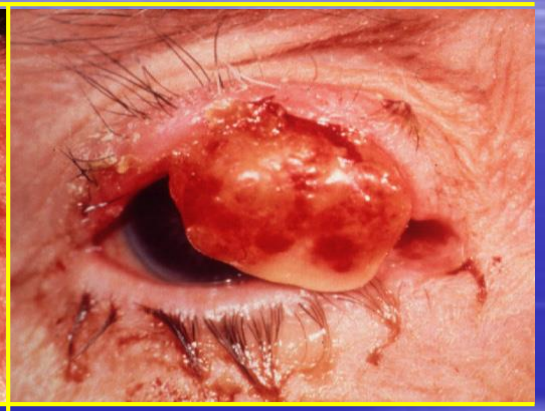
Nodular	Ulcerative
• Hard, hyperkeratotic nodule • No surface vascularization • May develop crusting fissures	• Red base • Borders sharply defined, indurated and elevated

Meibomian gland carcinoma

- Very rare aggressive tumour with 10% mortality
- Predilection for upper lid

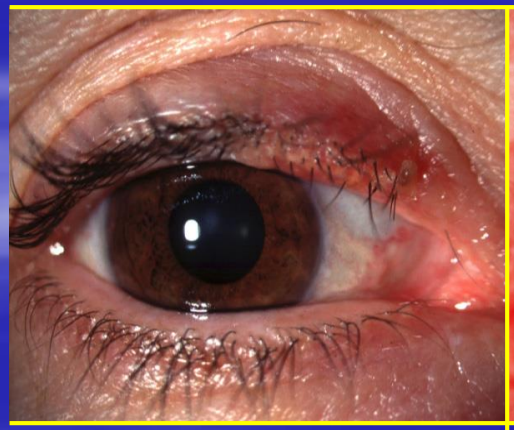
Nodular

Hard nodule; may mimic a chalazion

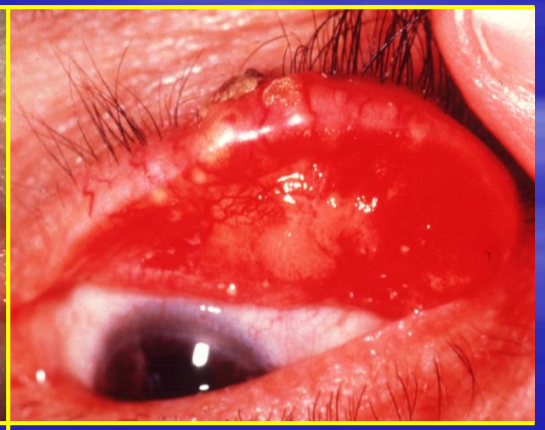


Very large tumour

Spreading



Diffuse thickening of lid margin and loss of lashes



Conjunctival invasion; may mimic chronic conjunctivitis

Melanoma

Nodular	Superficial spreading	From lentigo maligna (Hutchinson freckle)
• Blue-black nodule with normal surrounding skin • May be non-pigmented	• Plaque with irregular outline • Variable pigmentation	• Affects elderly • Slowly expanding pigmented macule

Kaposi sarcoma

- Vascular tumour occurring in patients with AIDS
- Usually associated with advanced disease
- Very sensitive to radiotherapy

Early	Advanced
Pink, red-violet lesion	May ulcerate and bleed

ECTROPION AND ENTROPION

1. Ectropion

- Involutional
- Cicatricial
- Paralytic
- Mechanical

2. Entropion

- Involutional
- Cicatricial
- Congenital
- Epiblepharon

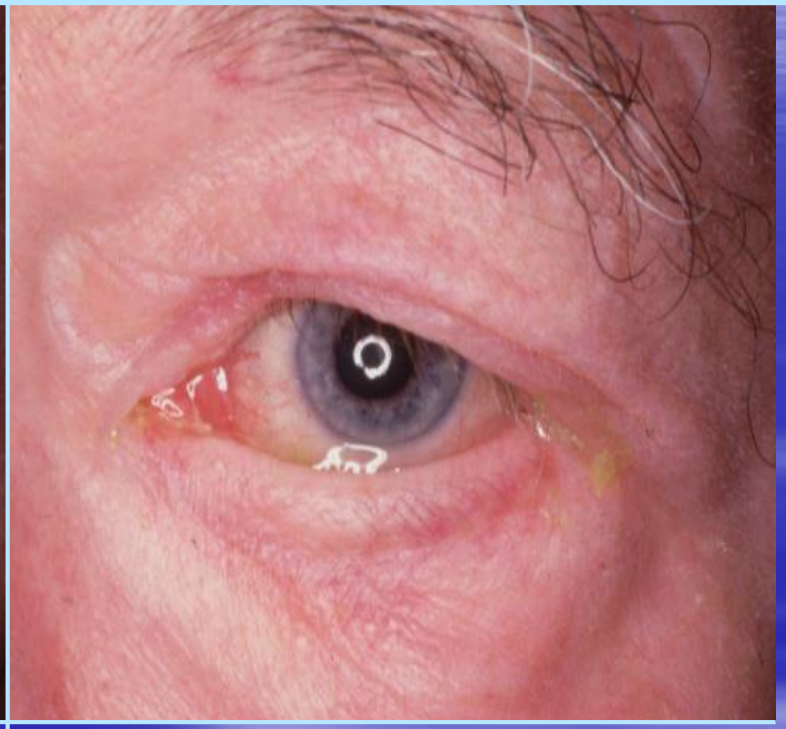
Involutional Ectropion

- Affects lower lid of elderly patients
- May cause chronic conjunctival inflammation and thickening

Paralytic Ectropion

Caused by facial nerve palsy which, if severe, may give rise to the following:

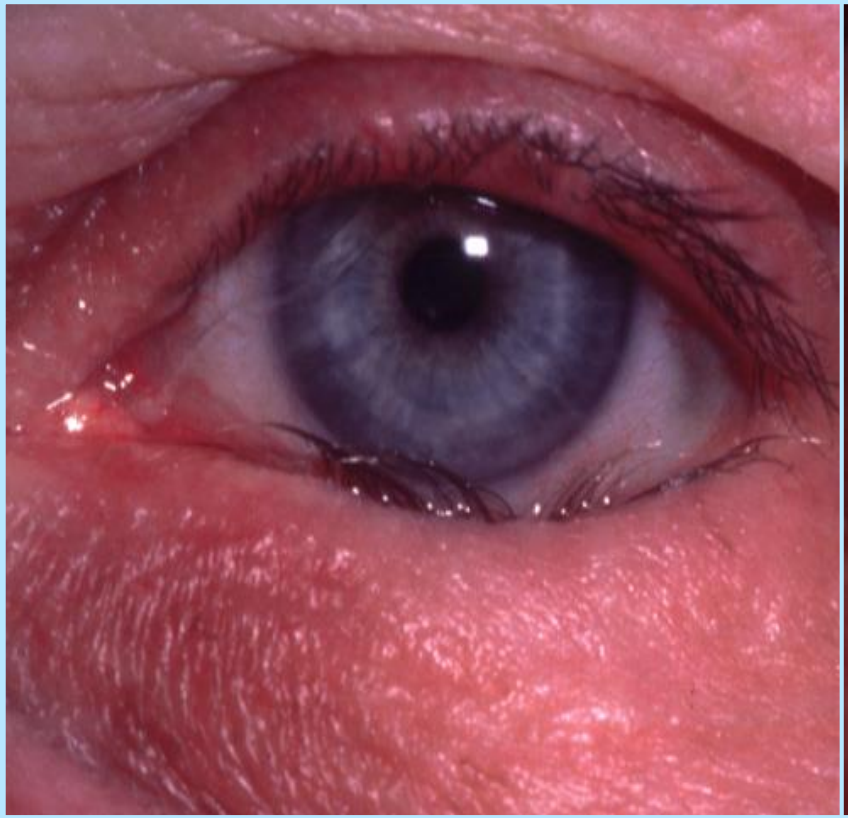
Exposure keratopathy caused by lagophthalmos



Epiphora caused by combination of:

- **Failure of lacrimal pump mechanism**
- **Increase in tear production resulting from corneal exposure**

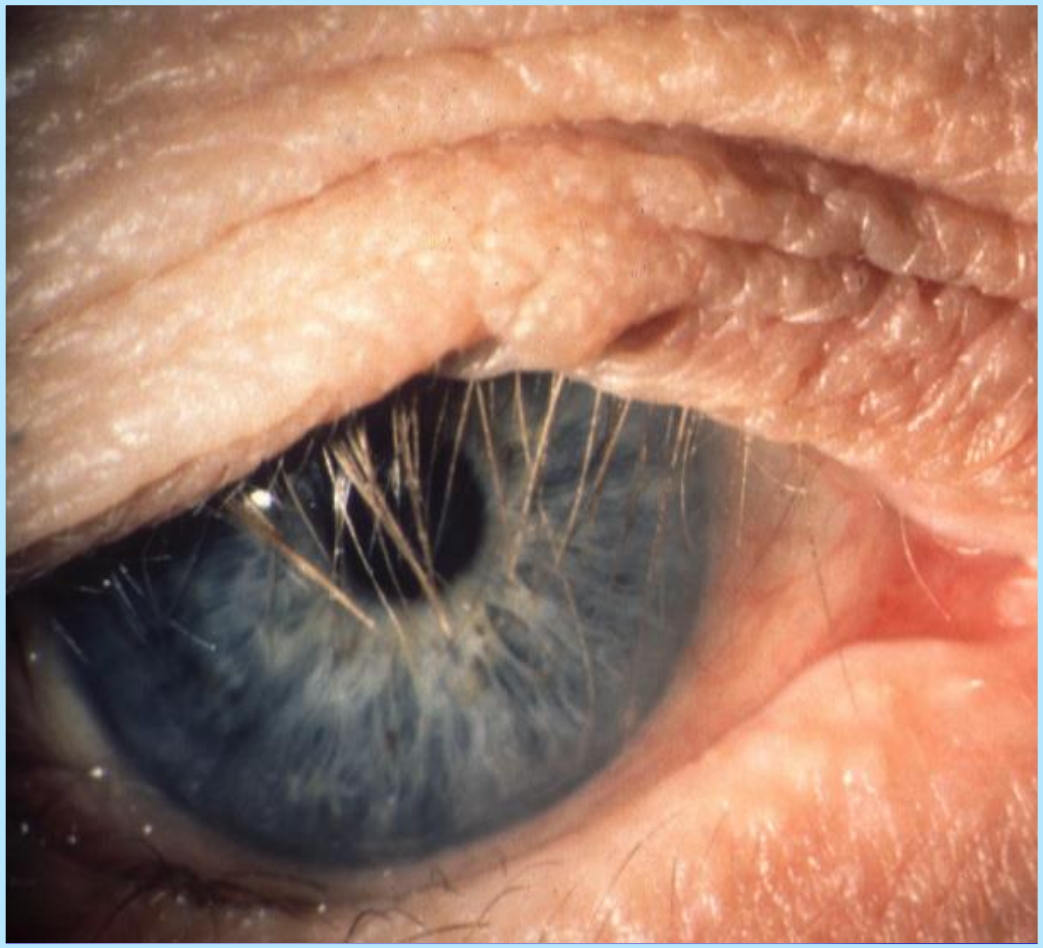
Involutional Entropion



Affects lower lid because upper lid has wider tarsus and is more stable

If longstanding may result in corneal ulceration

Cicatricial Entropion



- Severe scarring of palpebral conjunctiva which pulls lid margin towards globe
- May affect lower or upper eyelid
- Causes include cicatrizing conjunctivitis, trachoma and chemical burns

Congenital Entropion

- Very rare - not to be confused with epiblepharon
- Inturning of entire lower eyelid and lashes
- Absence of lower lid crease
- When skin is pulled down lid also pulls away from globe
- Does not resolve spontaneously

CLASSIFICATION OF PTOSIS

1. **Neurogenic**
   - Third nerve palsy
   - Third nerve misdirection
   - Horner syndrome
   - Marcus Gunn jaw-winking syndrome
2. **Myogenic**
   - Myasthenia gravis
   - Myotonic dystrophy
   - Ocular myopathies
   - Simple congenital
   - Blepharophimosis syndrome
3. **Aponeurotic**
4. **Mechanical**

Left third nerve palsy

Severe unilateral ptosis and defective adduction

Normal abduction

Defective elevation

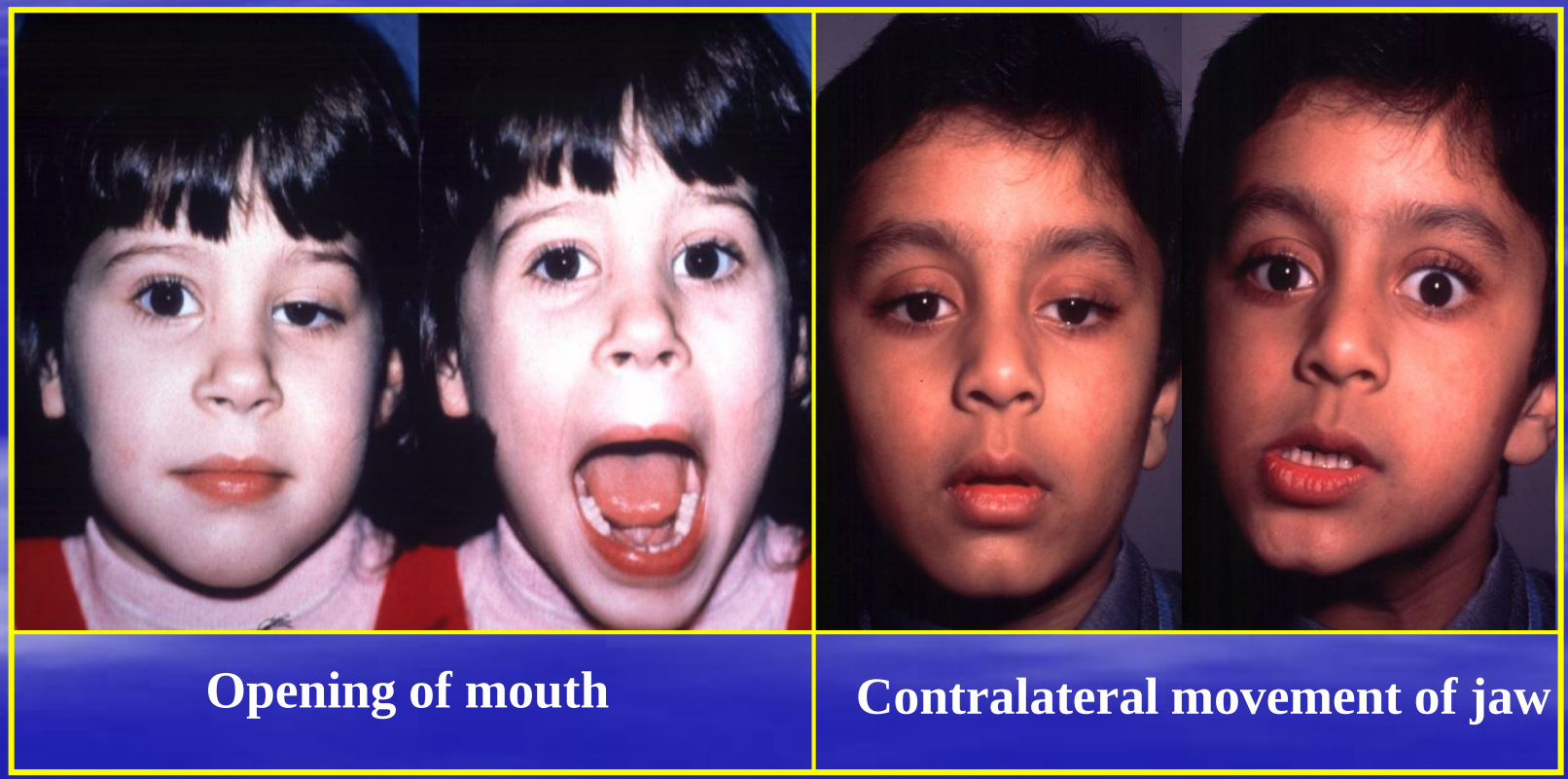
Defective depression

Horner syndrome

- Caused by oculosympathetic palsy
- Usually unilateral mild ptosis and miosis
- Normal pupillary reactions
- Slight elevation of lower lid
- Iris hypochromia if congenital or longstanding
- Anhydrosis if lesion is below superior cervical ganglion

Marcus Gunn jaw-winking syndrome

- Accounts for about 5% of all cases of congenital ptosis
- Retraction or ‘wink’ of ptotic lid in conjunction with stimulation of ipsilateral pterygoid muscles



Opening of mouth

Contralateral movement of jaw

Simple congenital Ptosis

- Developmental dystrophy of levator muscle
- Occasionally associated with weakness of superior rectus

Unilateral or bilateral ptosis of varying severity

In downgaze ptotic eyelid is slightly higher

Frequent absence of upper lid crease

Usually poor levator function

Aponeurotic Ptosis

- Weakness of levator aponeurosis
- Causes - involutional, postoperative and blepharochalasis

Mild

High upper lid crease

Good levator function

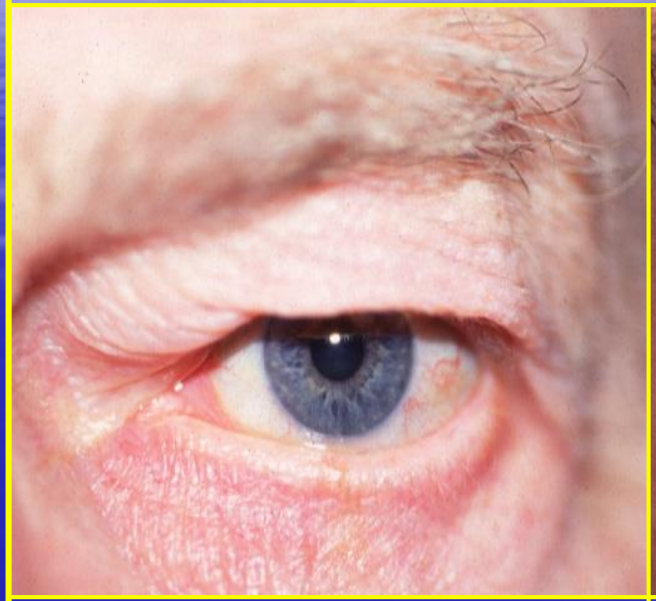
Severe

Absent upper lid crease

Deep sulcus

Mechanical Ptosis

Causes



Dermatochalasis

Large tumours

Severe lid oedema

Anterior orbital lesions

Lacrimal System & ORBIT

Acute dacryocystitis

Usually secondary to nasolacrimal duct obstruction

- Tender canthal swelling
- Mild preseptal cellulitis

- May develop into abscess

Treatment

- Systemic antibiotics and warm compresses
- DCR after acute infection is controlled

Chronic dacryocystitis

Epiphora and chronic or recurrent unilateral conjunctivitis

Painless swelling at inner canthus

Expressed mucopurulent material

Treatment - DCR

Orbital cellulitis

- Infection behind orbital septum
- Usually secondary to ethmoiditis
- Presentation - severe malaise, fever and orbital signs

Signs

- Severe eyelid oedema and redness
- Proptosis - most frequently lateral and down
- Painful ophthalmoplegia
- Optic nerve dysfunction if advanced

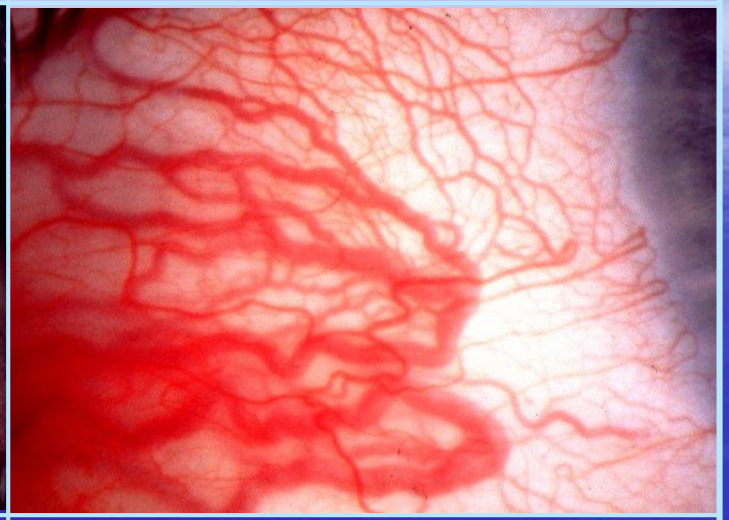
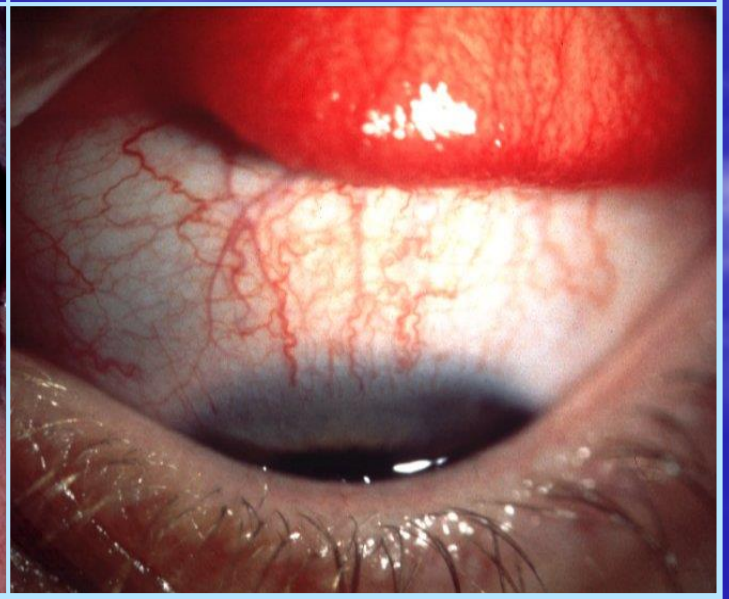
Management of orbital cellulitis

Pre-treatment

Post-treatment

1. Hospital admission
2. Systemic antibiotic therapy
3. Monitoring of optic nerve function
4. Indications for surgery
   - Resistance to antibodies
   - Orbital or subperiosteal abscess
   - Optic neuropathy

Thyroid Ophthalmopathy

Periorbital and lid swelling	Conjunctival hyperaemia
	
Chemosis	**Superior limbic keratoconjunctivitis**
	

Signs of eyelid retraction

Occurs in about 50%

- Bilateral lid retraction
- No associated proptosis

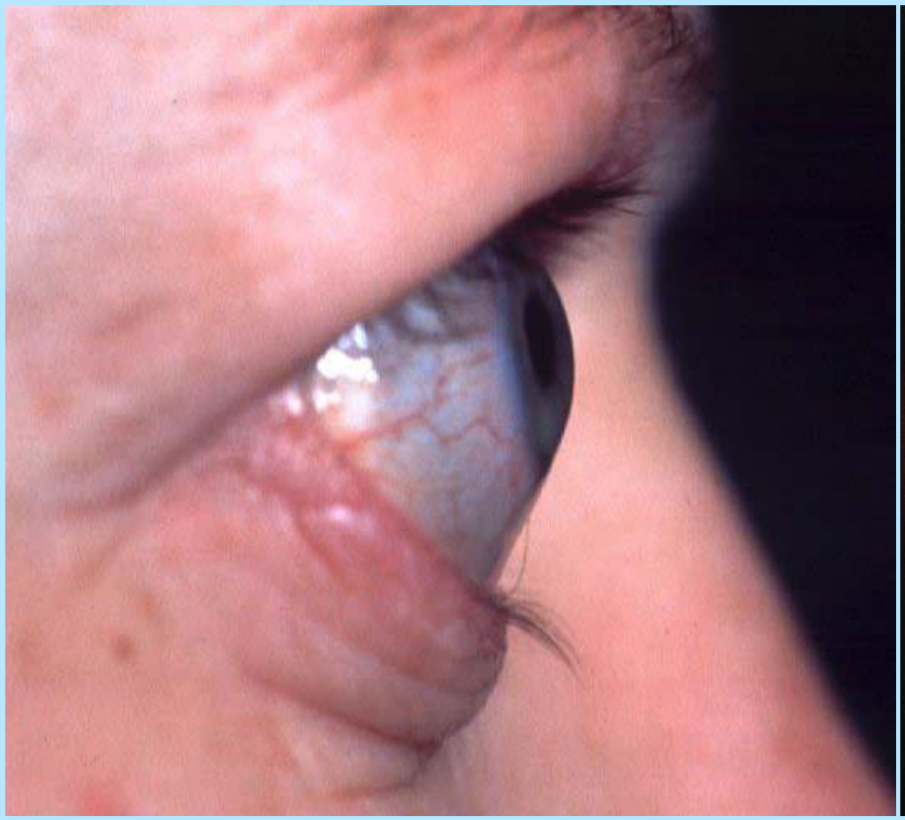
- Bilateral lid retraction
- Bilateral proptosis

- Unilateral lid retraction
- Unilateral proptosis

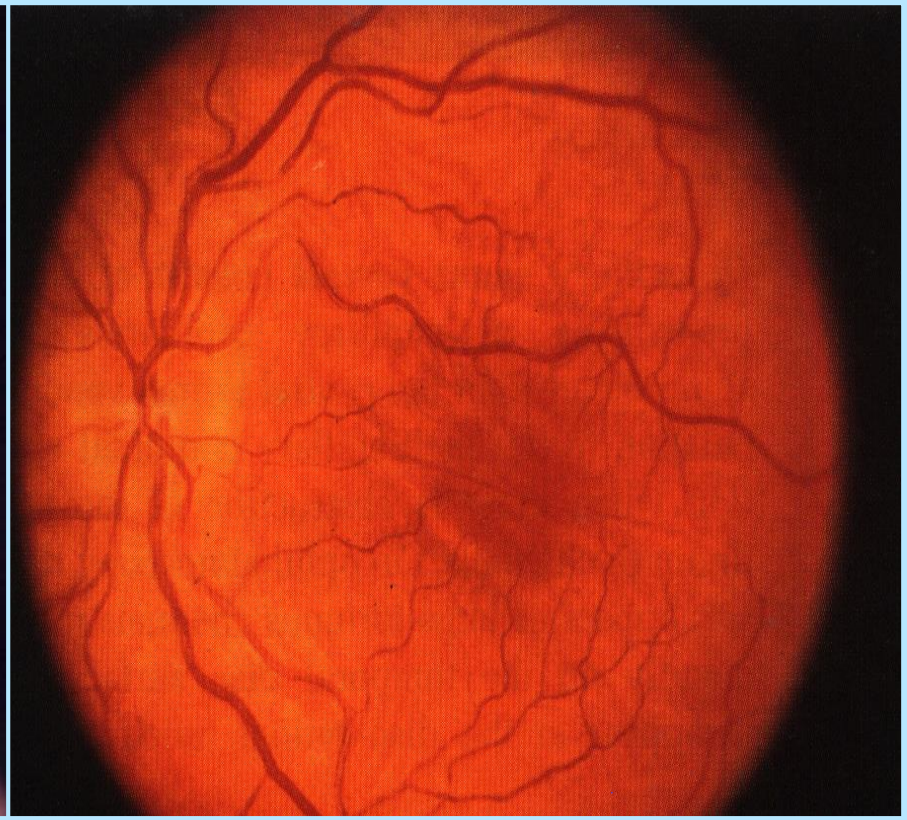
- Lid lag in downgaze

Proptosis

- Occurs in about 50%
- Uninfluenced by treatment of hyperthyroidism



Axial and permanent in about 70%



May be associated with choroidal folds

Treatment options

- Systemic steroids
- Radiotherapy
- Surgical decompression

Superficial dermoid cyst

- Presents in infancy
- No displacement of globe

- Most commonly superotemporal
- Freely mobile under skin

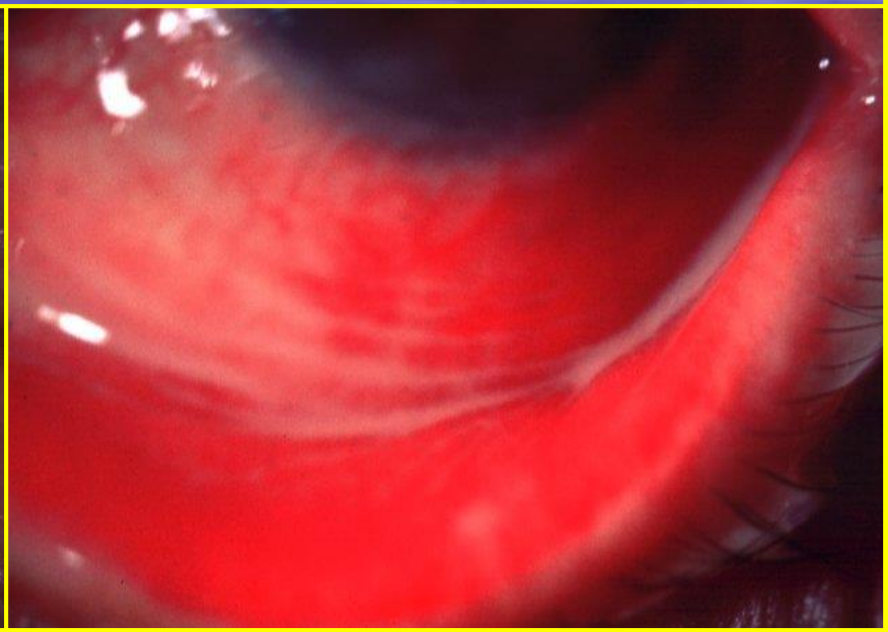
- Occasionally superonasal
- Posterior margins are easily palpable

CONJUNCTIVA

CONJUNCTIVAL INFECTIONS

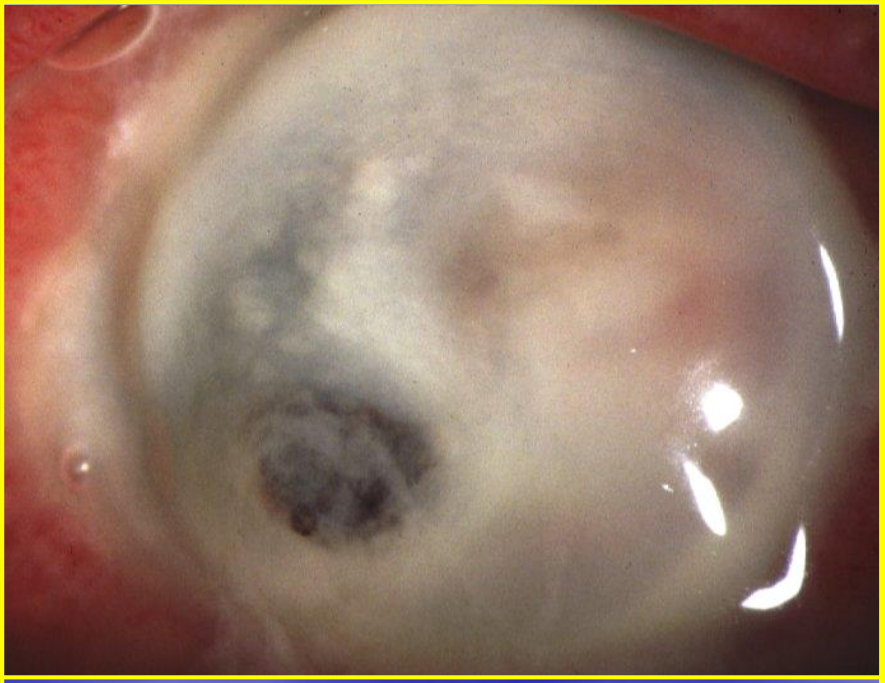
1. **Bacterial**
   - Simple bacterial conjunctivitis
   - Gonococcal keratoconjunctivitis
2. **Viral**
   - Adenoviral keratoconjunctivitis
   - Molluscum contagiosum conjunctivitis
   - Herpes simplex conjunctivitis
3. **Chlamydial**
   - Adult chlamydial keratoconjunctivitis
   - Neonatal chlamydial conjunctivitis
   - Trachoma

Simple bacterial conjunctivitis

Signs	
	
Crusted eyelids and conjunctival injection	Subacute onset of mucopurulent discharge

Treatment - broad-spectrum topical antibiotics

Gonococcal keratoconjunctivitis

Signs	Complications
	
Acute, profuse, purulent discharge, hyperaemia and chemosis	Corneal ulceration, perforation and endophthalmitis if severe

Treatment

- Topical gentamicin and bacitracin
- Intravenous cefoxitin or cefotaxime

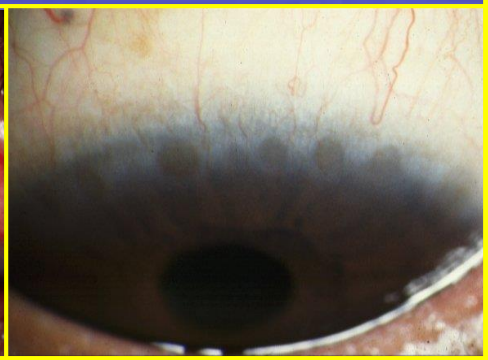
Trachoma

- Infection with serotypes A, B, Ba and C of *Chlamydia trachomatis*
- Fly is major vector in infection-reinfection cycle

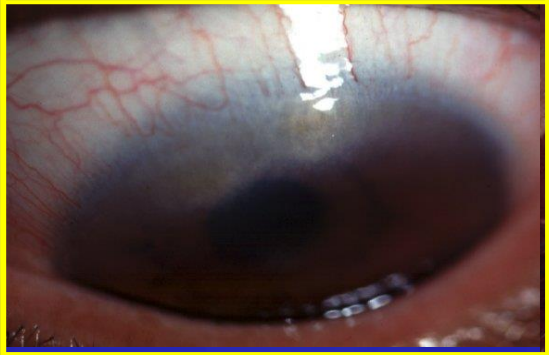
Progression

Acute follicular conjunctivis

Conjunctival scarring (Arlt line)



Herbert pits



Pannus formation

Trichiasis

Cicatricial entropion

Treatment - systemic Azithromycin

Vernal keratoconjunctivitis

Frequently associated with atopy: asthma, hay fever and dermatitis

- **Recurrent, bilateral**
- **Affects children and young adults**
- **More common in males and in warm climates**
- **Itching, mucoid discharge and lacrimation**

Types

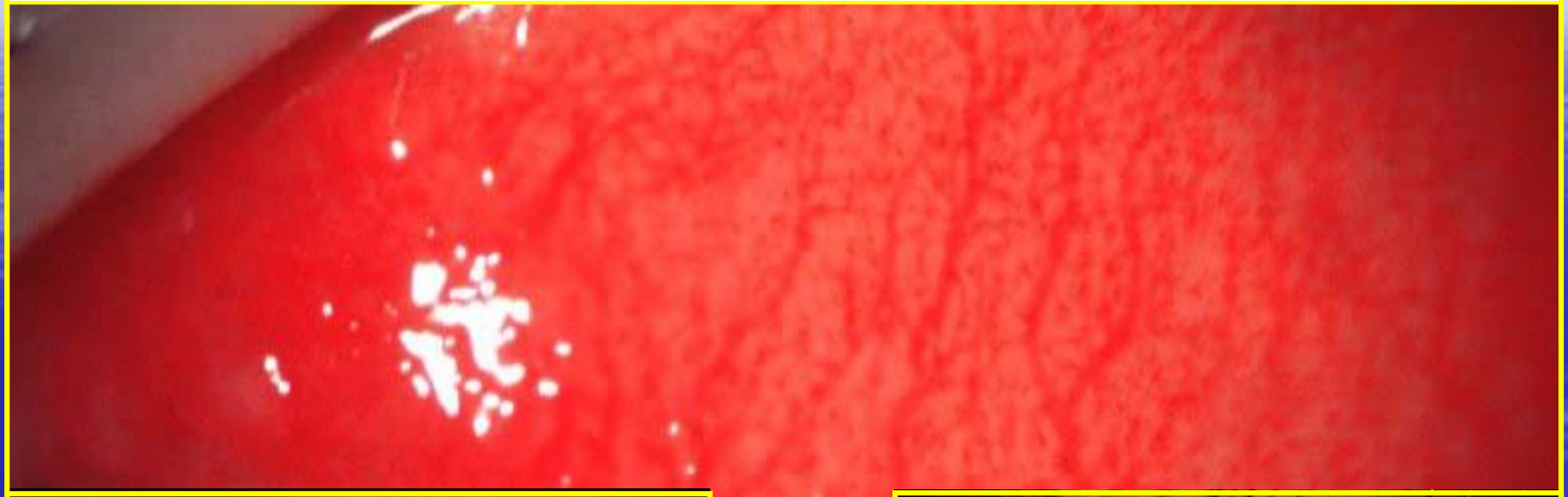
- **Palpebral**
- **Limbal**
- **Mixed**

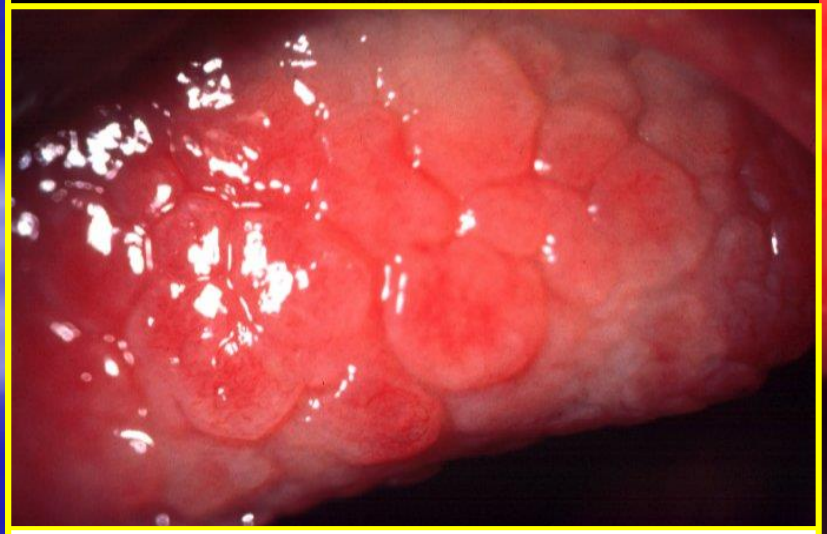
Treatment

- **Topical mast cell stabilizers**
- **Topical steroids**

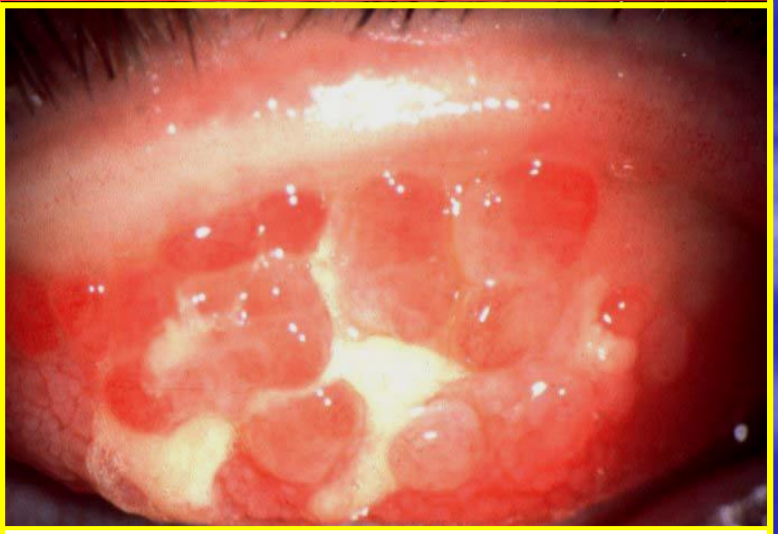
Progression of vernal conjunctivitis

Diffuse papillary hypertrophy, most marked on superior tarsus



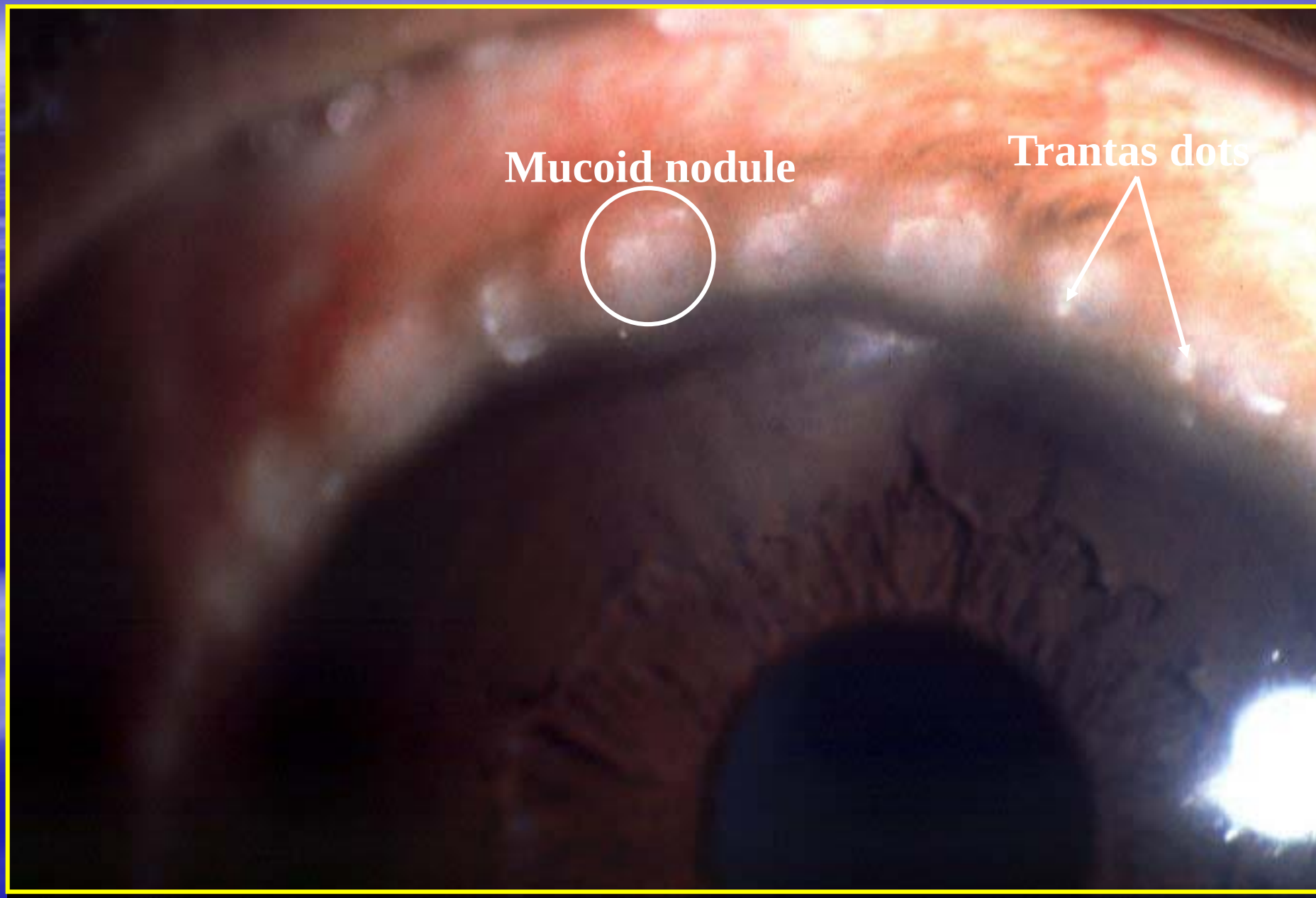


Formation of cobblestone papillae



Rupture of septae - giant papillae

Limbal vernal

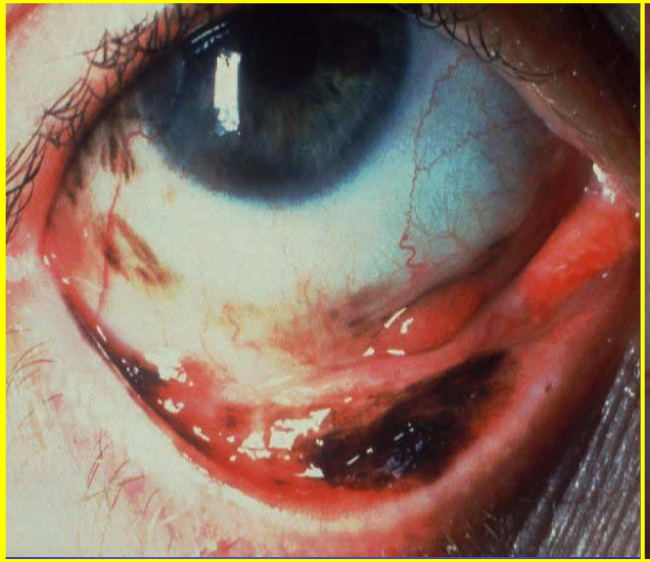
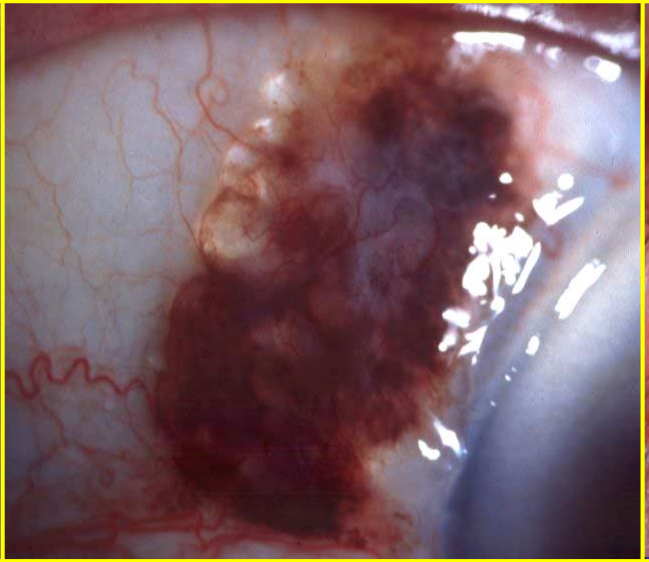
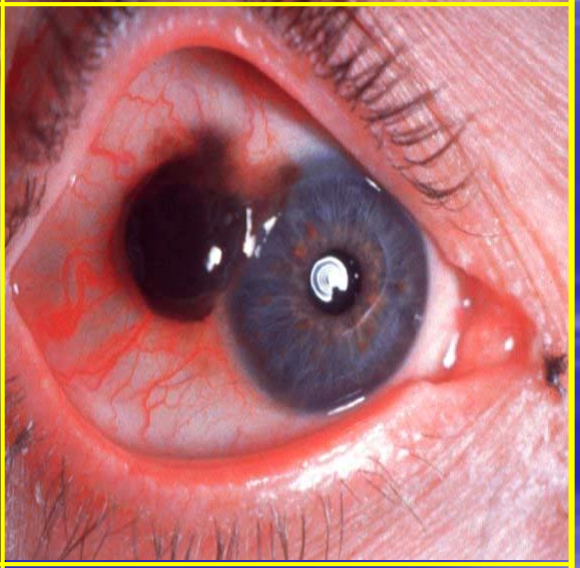


Conjunctival Naevus

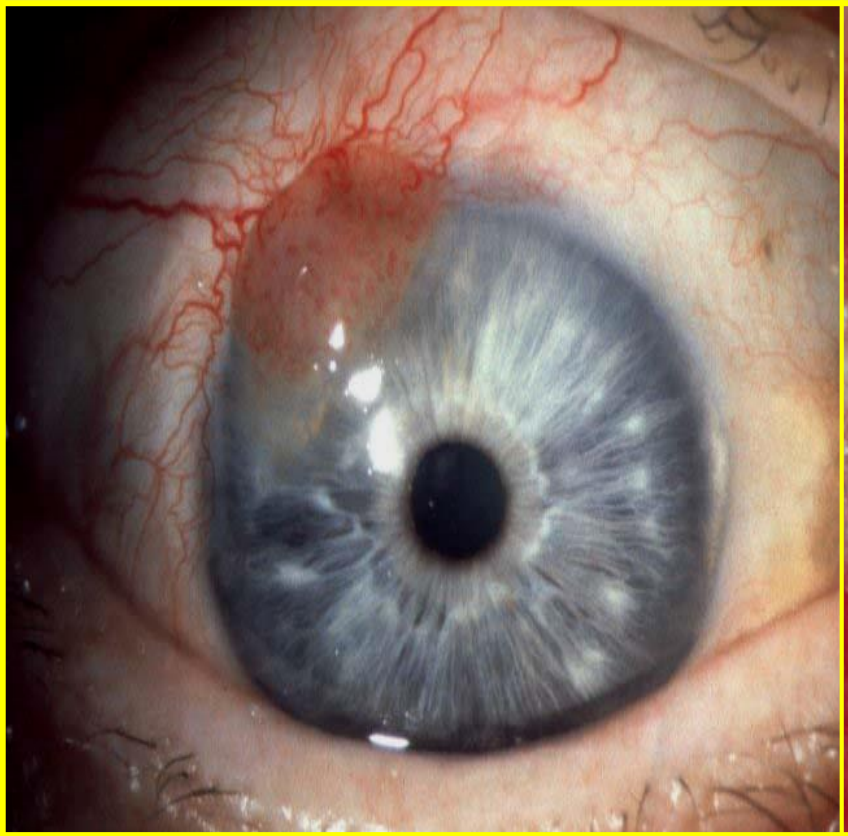
- Presents in first two decades
- Sharply demarcated and slightly elevated

- Most frequently juxtalimbal
- 30% are almost non-pigmented

Conjunctival melanoma

From PAM with atypia	From naevus	Primary
		
• Most common type • Sudden appearance of nodules in PAM	• Very rare • Sudden increase in size or pigmentation	• Solitary nodule • Frequently juxtalimbal but may be anywhere

Squamous cell carcinoma

Signs	Progression
	
• Arises from intraepithelial neoplasia or *de novo* • Presents in late adulthood • Frequently juxtalimbal	• Slow-growing • May spread extensively • Rarely metastasizes

CORNEA

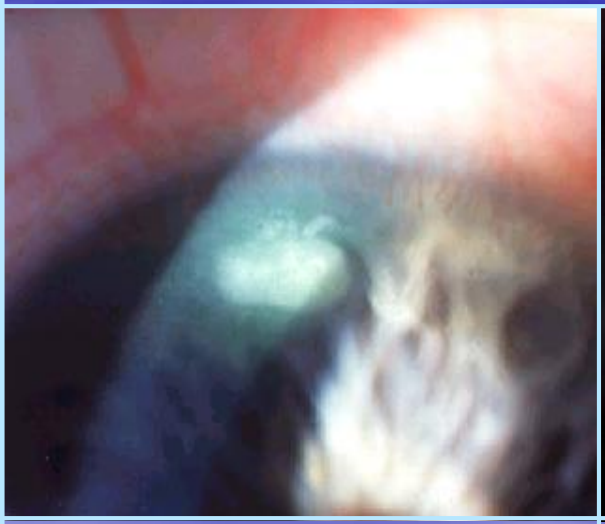
PERIPHERAL CORNEAL INFLAMMATION

1. **Marginal keratitis**
2. **Rosacea keratitis**
3. **Phlyctenulosis**
4. **Acute stromal keratitis**

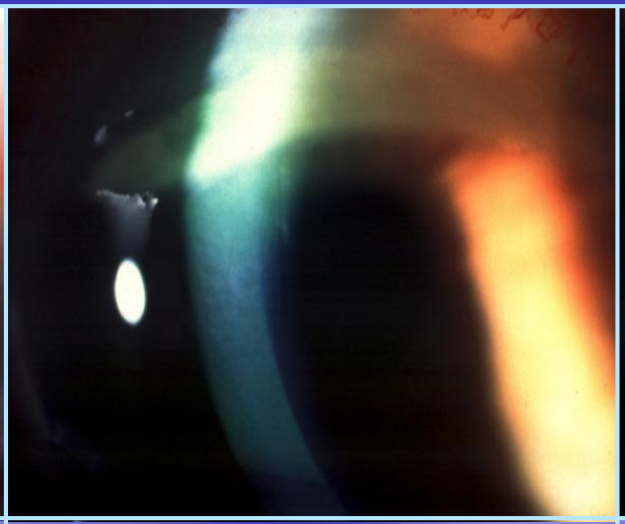
Marginal keratitis

- Hypersensitivity reaction to *Staph.* exotoxins
- May be associated with *Staph.* blepharitis
- Unilateral, transient but recurrent

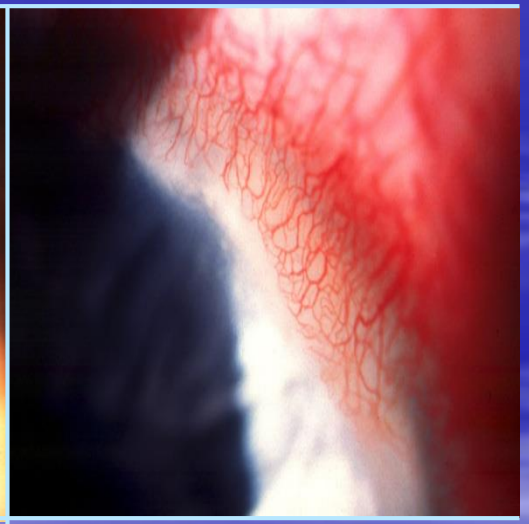
Progression



Subepithelial infiltrate separated by clear zone



Circumferential spread



Bridging vascularization followed by resolution

Treatment - short course of topical steroids

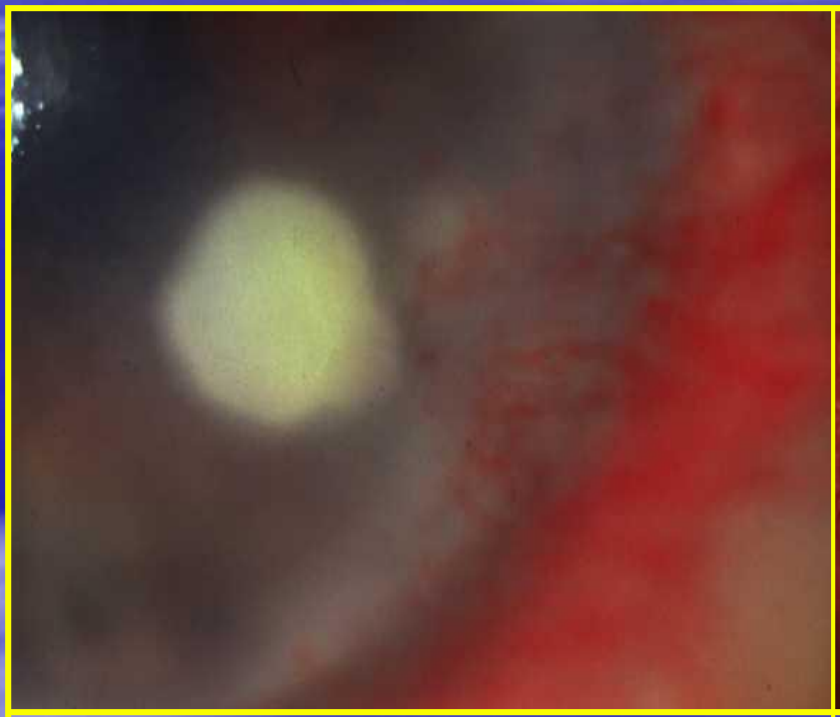
CORNEAL INFECTIONS

1. **Bacterial keratitis**
2. **Fungal keratitis**
3. **Herpes simplex keratitis**
   - **-Epithelial**
   - **-Disciform**
4. **Herpes zoster keratitis**

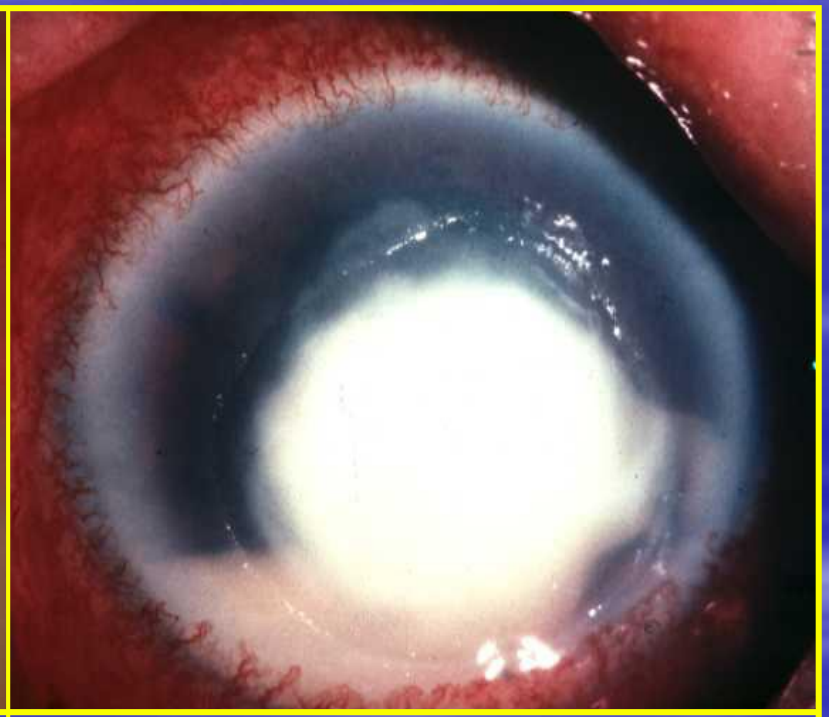
Bacterial keratitis

Predisposing factors

- Contact lens wear
- Chronic ocular surface disease
- Corneal hypoaesthesia



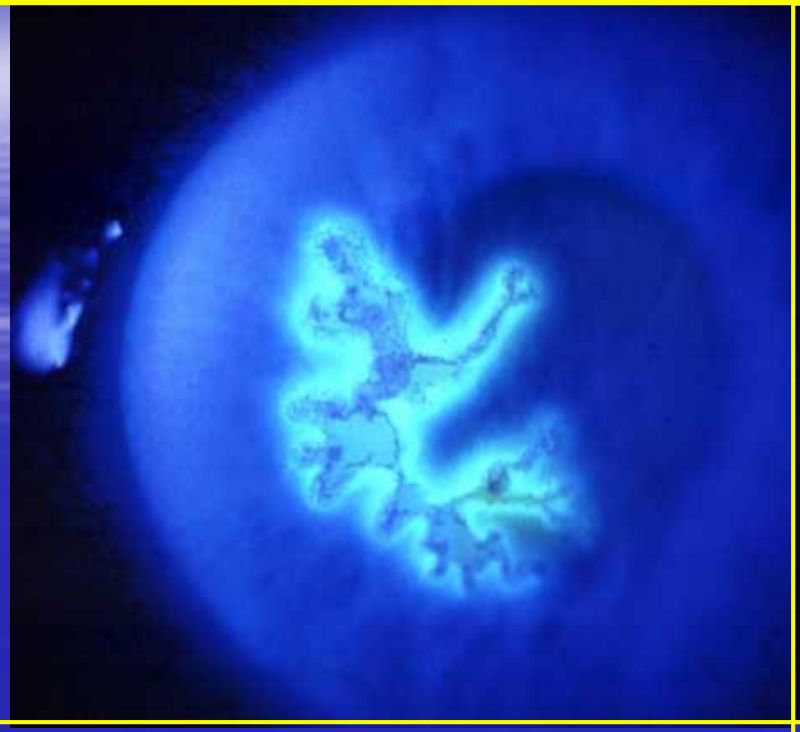
Expanding oval, yellow-white, dense stromal infiltrate



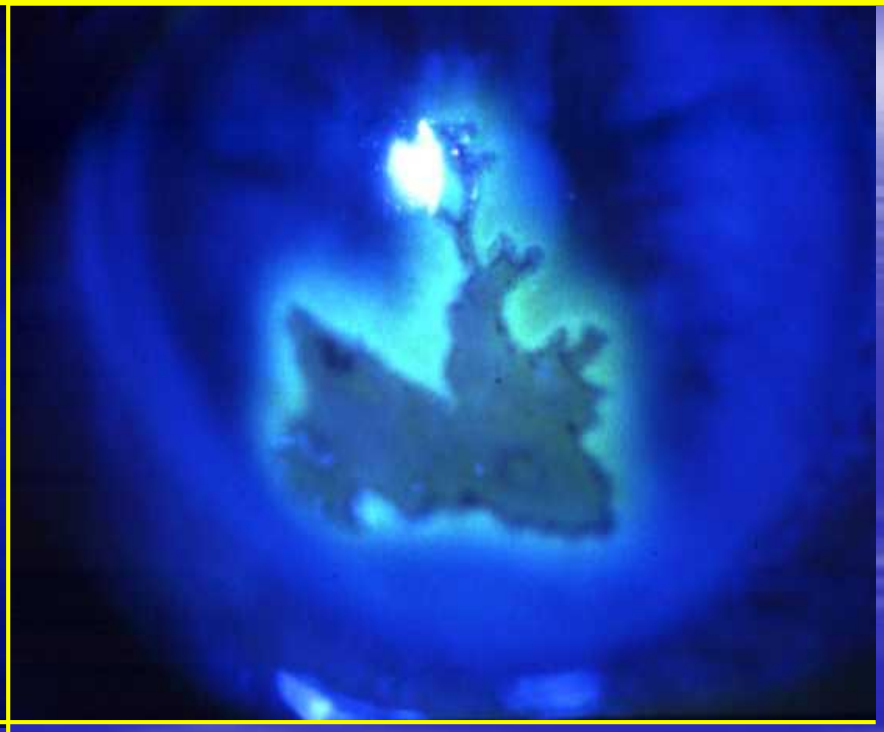
Stromal suppuration and hypopyon

Treatment - topical ciprofloxacin 0.3% or ofloxacin 0.3%

Herpes simplex epithelial keratitis



- Dendritic ulcer with terminal bulbs
- Stains with fluorescein



- May enlarge to become geographic

Treatment

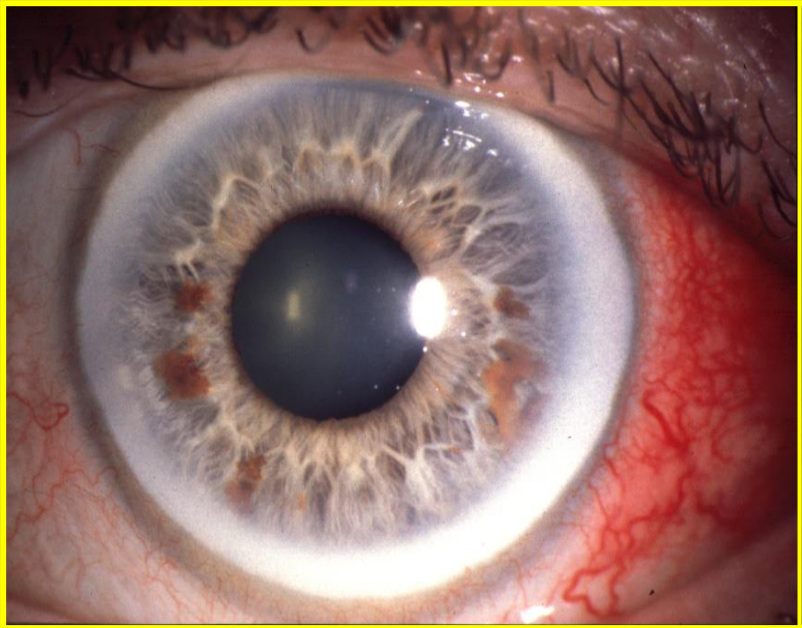
- Aciclovir 3% ointment x 5 daily
- Trifluorothymidine 1% drops 2-hourly
- Debridement if non-compliant

CORNEAL DEGENERATIONS

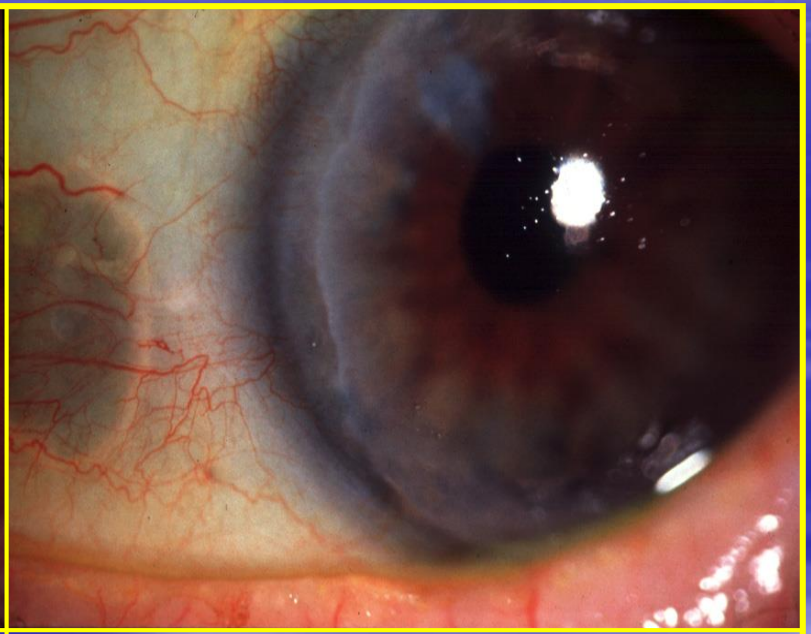
1. **Age-related**
   - **Arcus senilis**
2. **Lipid keratopathy**
   - **Primary**
   - **Secondary**
3. **Band keratopathy**

Arcus senilis

- Innocuous and extremely common in elderly
- Occasionally associated with hyperlipoproteinaemia



- Bilateral, circumferential bands of lipid deposits
- Diffuse central and sharp peripheral border

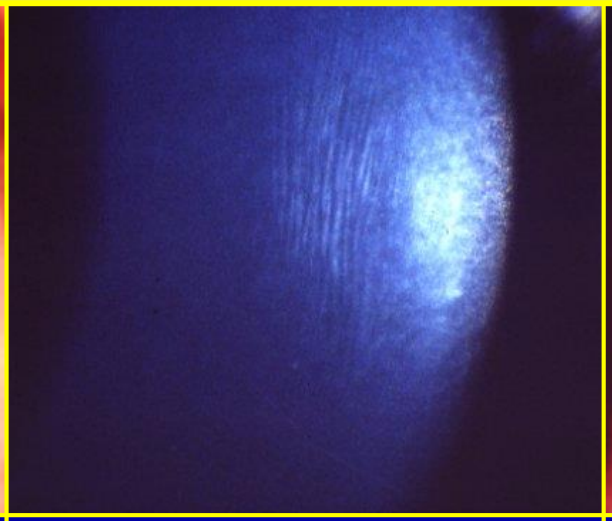


- Peripheral border separated from limbus by clear zone
- Clear zone may be thinned (senile furrow)

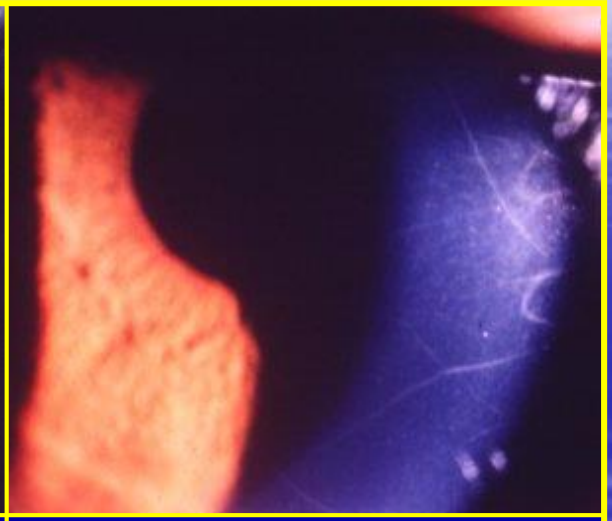
Signs of keratoconus

Bilateral in 85% but asymmetrical

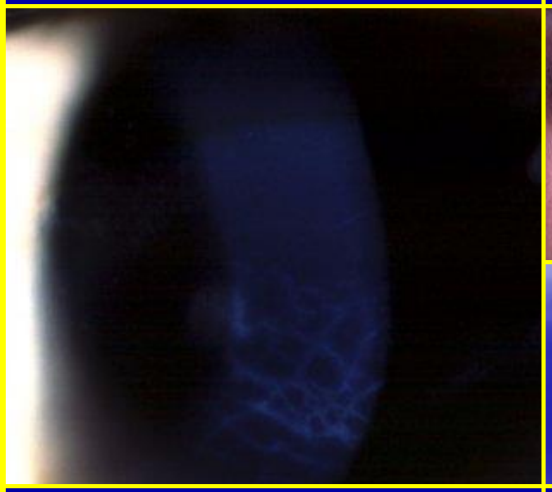
Oil droplet reflex



Vogt striae



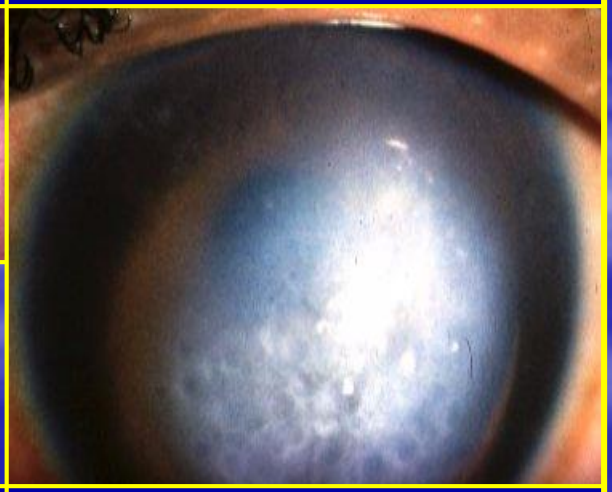
Prominent corneal nerves



Fleischer ring & scarring

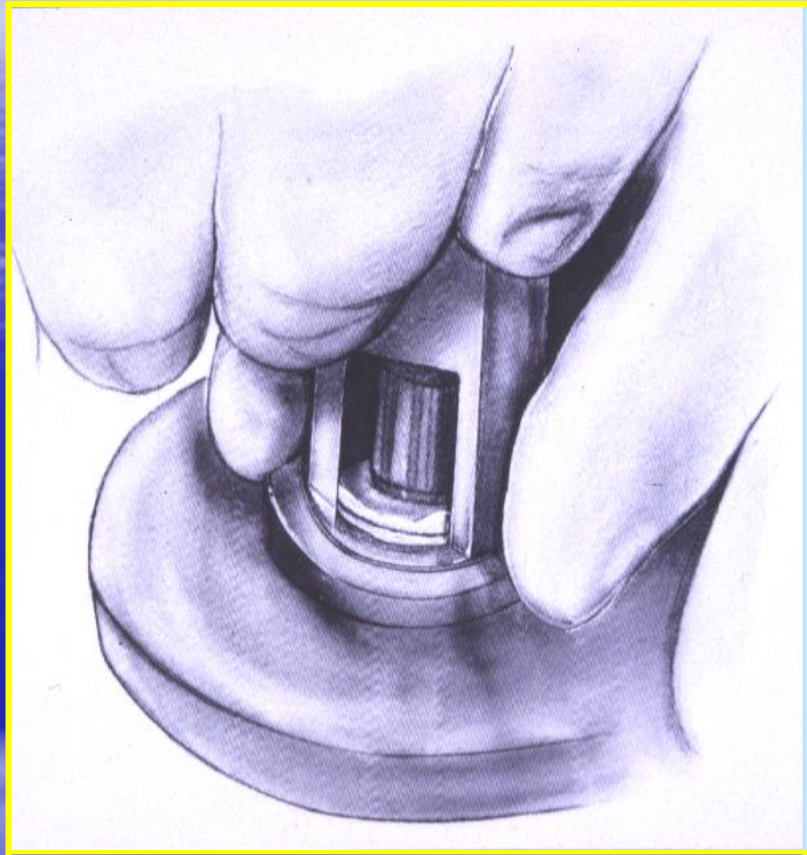
Bulging of lower lids on downgaze

Munson sign

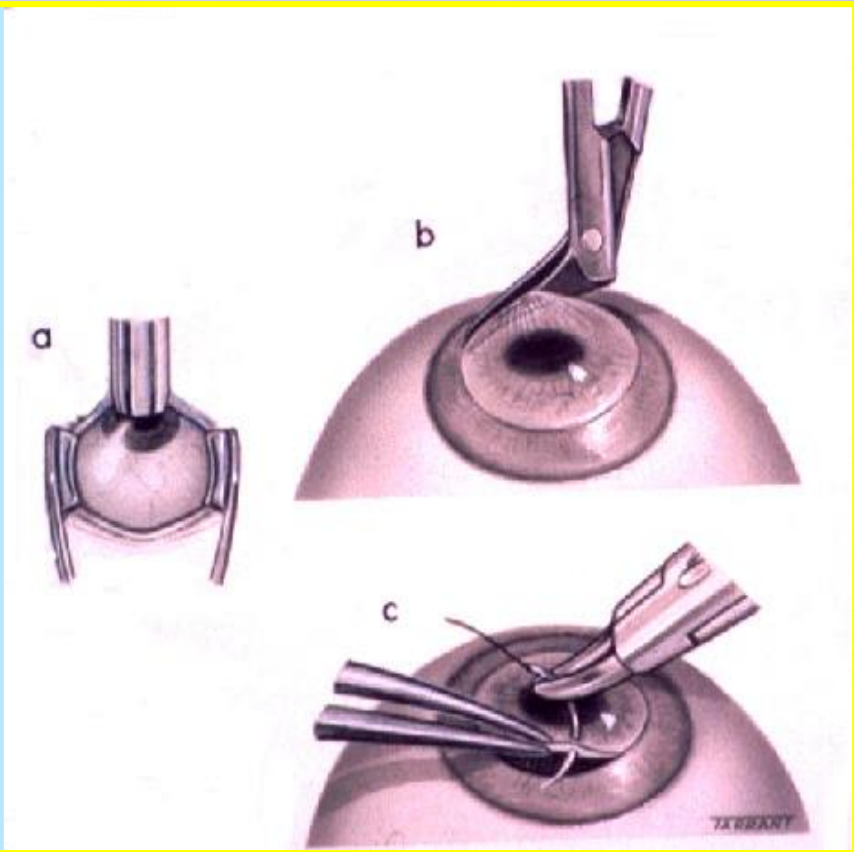


Acute hydrops

Technique of penetrating keratoplasty



Excision of donor tissue

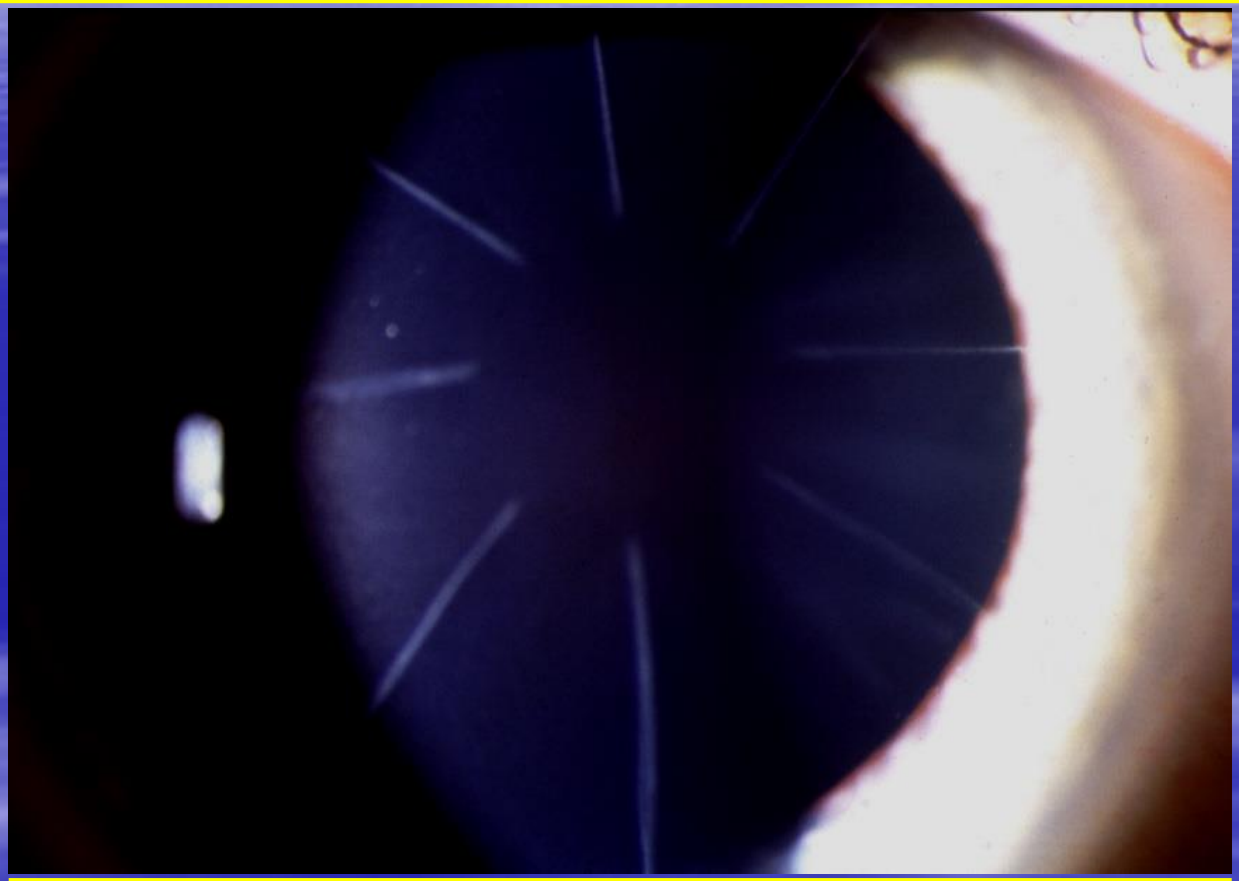


a, b - Excision of host tissue

c - Fixation of donor tissue

Radial keratotomy

- Decreases myopia by flattening cornea
- Deep incisions from edge of optical zone to limbus



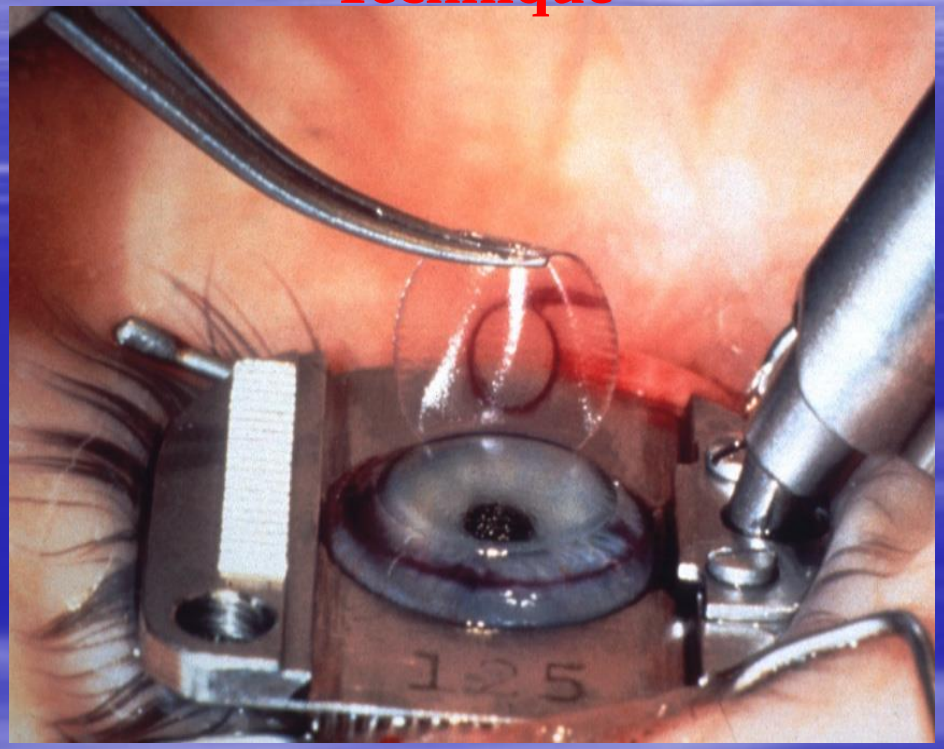
Main indications

- Stable myopia of up to 8D
- Otherwise normal cornea

Laser *in-situ* keratomileusis (LASIK)

Indications - corrects myopia, hypermetropia & astigmatism

Technique



- Thin flap of cornea fashioned
- Bed treated with excimer laser
- Flap repositioned

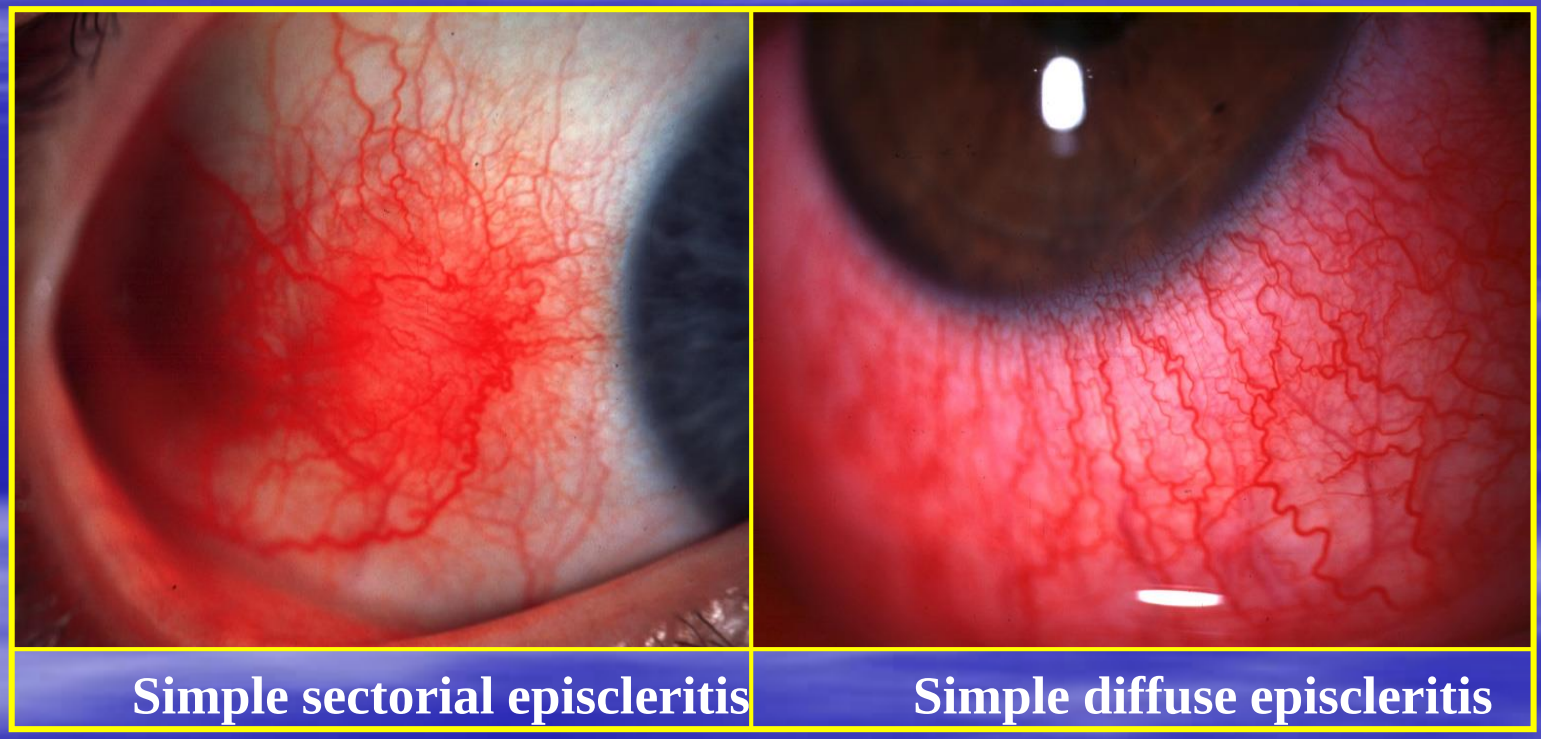
SCLERA

EPISCLERITIS AND SCLERITIS

1. **Episcleritis**
   - **Simple**
   - **Nodular**
2. **Anterior scleritis**
   - **Non-necrotizing diffuse**
   - **Non-necrotizing nodular**
   - **Necrotizing with inflammation**
   - **Necrotizing without inflammation (scleromalacia perforans)**
3. **Posterior scleritis**

Simple episcleritis

- Common, benign, self-limiting but frequently recurrent
- Typically affects young adults
- Seldom associated with a systemic disorder



Simple sectorial episcleritis | Simple diffuse episcleritis

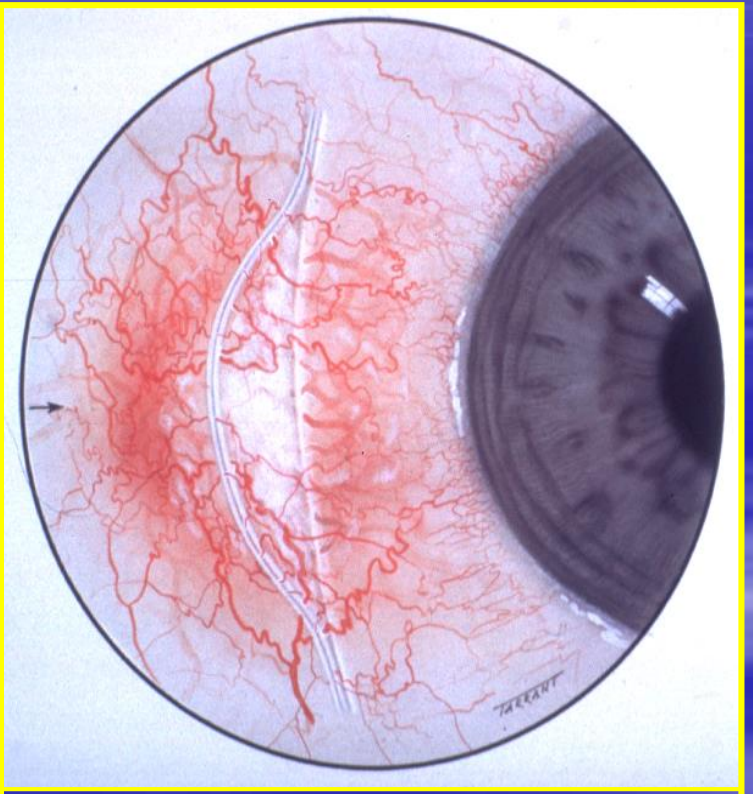
Treatment

- Topical steroids
- Systemic flurbiprofen (00 mg tid if unresponsive

Nodular episcleritis

- Less common than simple episcleritis
- May take longer to resolve
- Treatment - similar to simple episcleritis

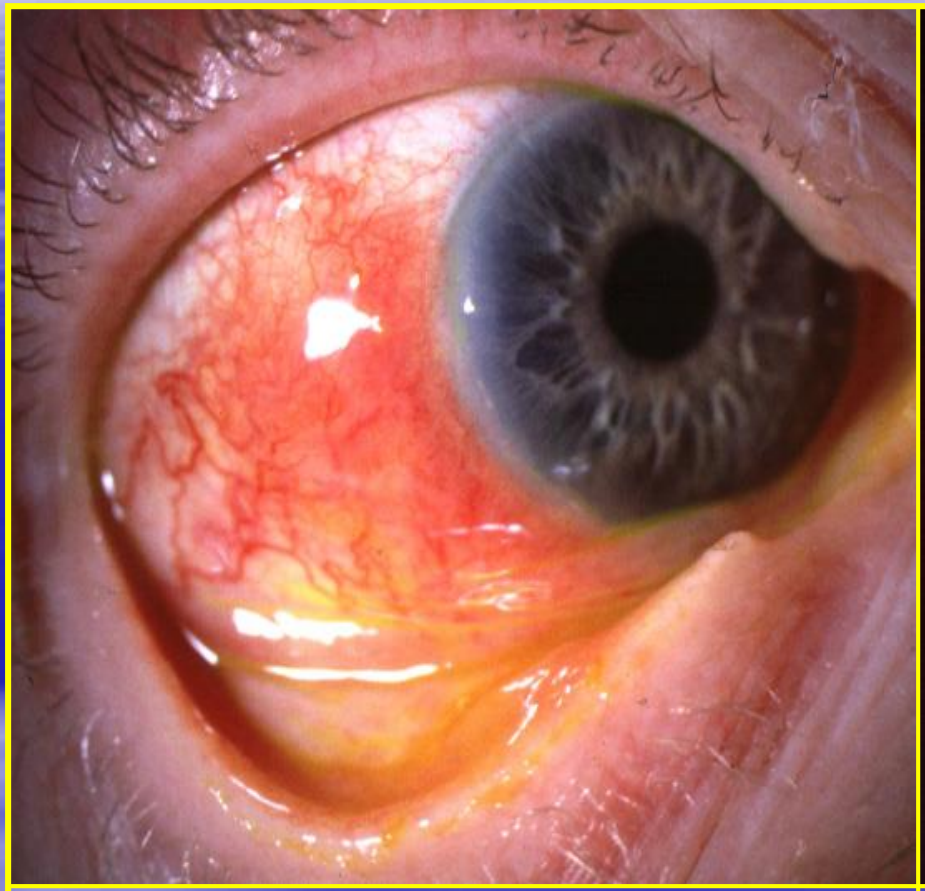
Localized nodule which can be moved over sclera



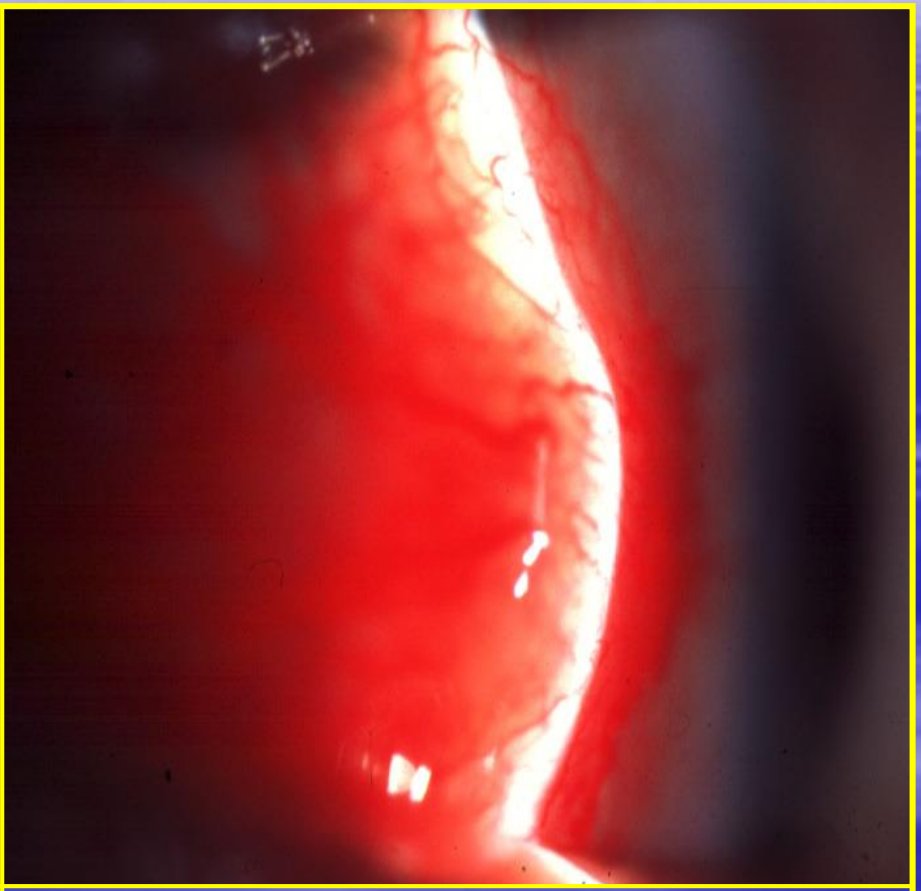
Deep scleral part of slit-beam not displaced

Nodular anterior non-necrotizing scleritis

More serious than diffuse scleritis



On cursory examination resembles nodular episcleritis



Scleral nodule cannot be moved over underlying tissue

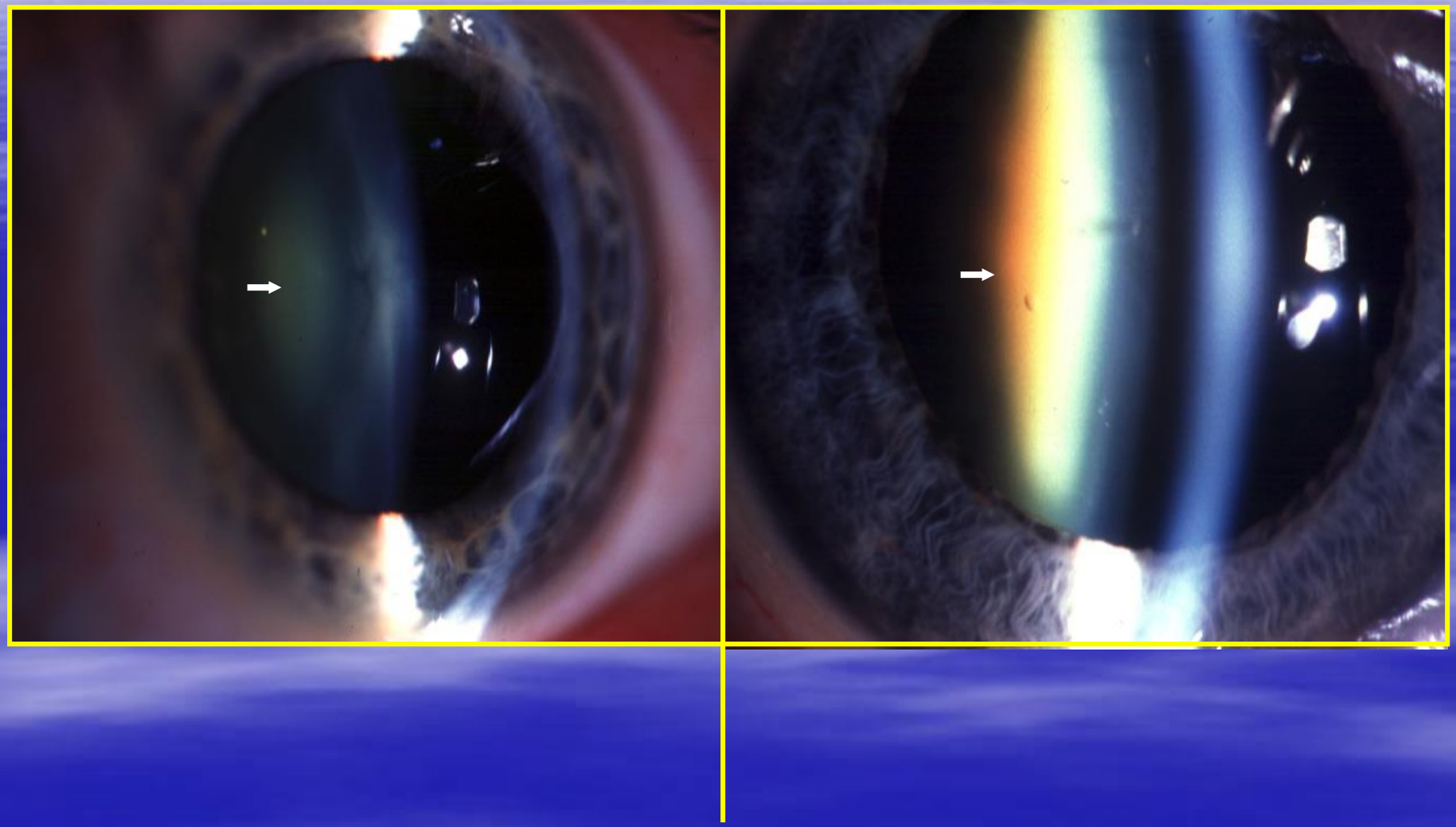
Treatment - similar to diffuse non-necrotizing scleritis

CRYSTALLINE LENS

Congenital Cataract

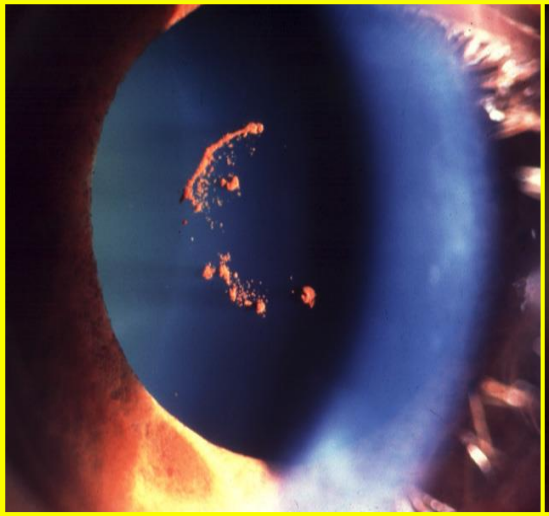
- 33% - idiopathic - may be unilateral or bilateral
- 33% - inherited - usually bilateral
- 33% - associated with systemic disease - usually bilateral
- Other ocular anomalies present in 50%

Senile Cataract

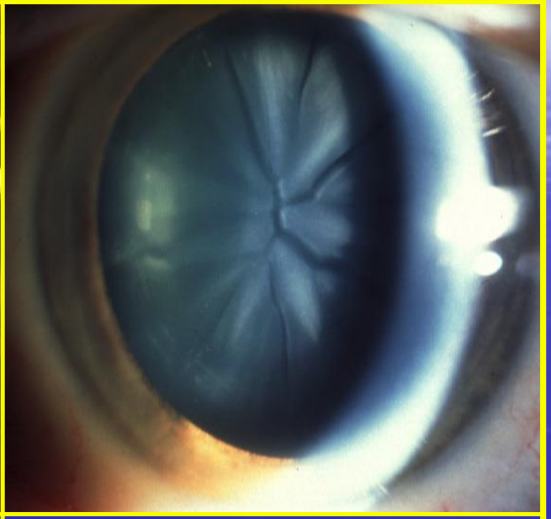


Causes of traumatic cataract

Concussion

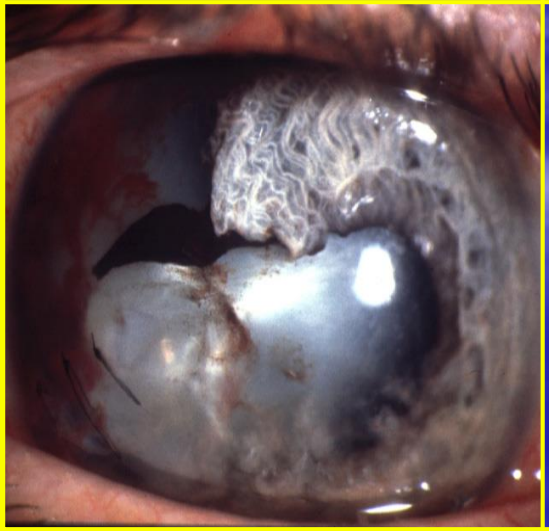


‘Vossius’ ring from imprinting of iris pigment



Flower-shaped

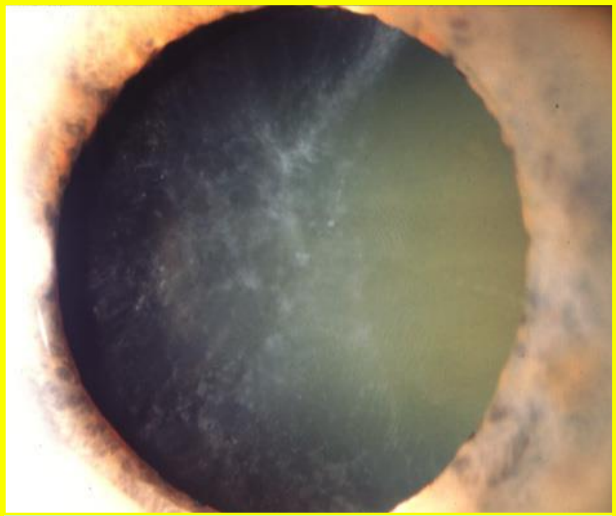
Penetration



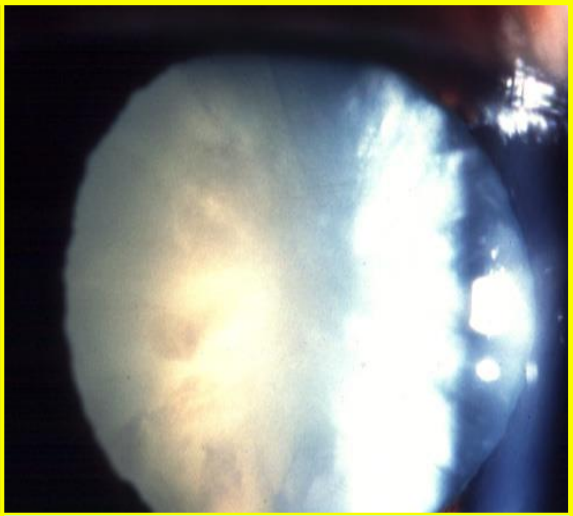
Other causes

- Ionizing radiation
- Electric shock
- Lightning

Classification according to maturity

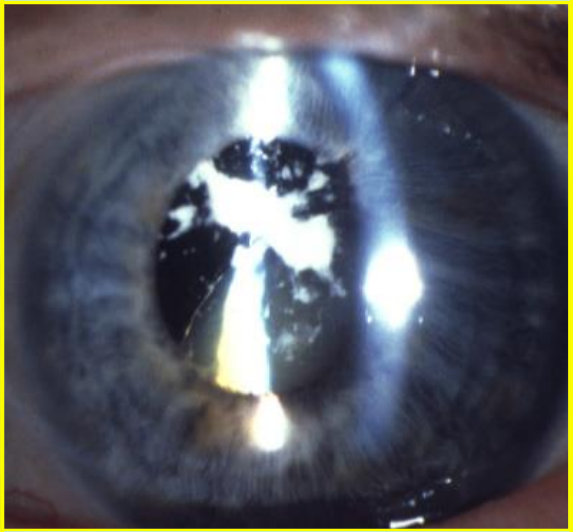


Immature



Mature

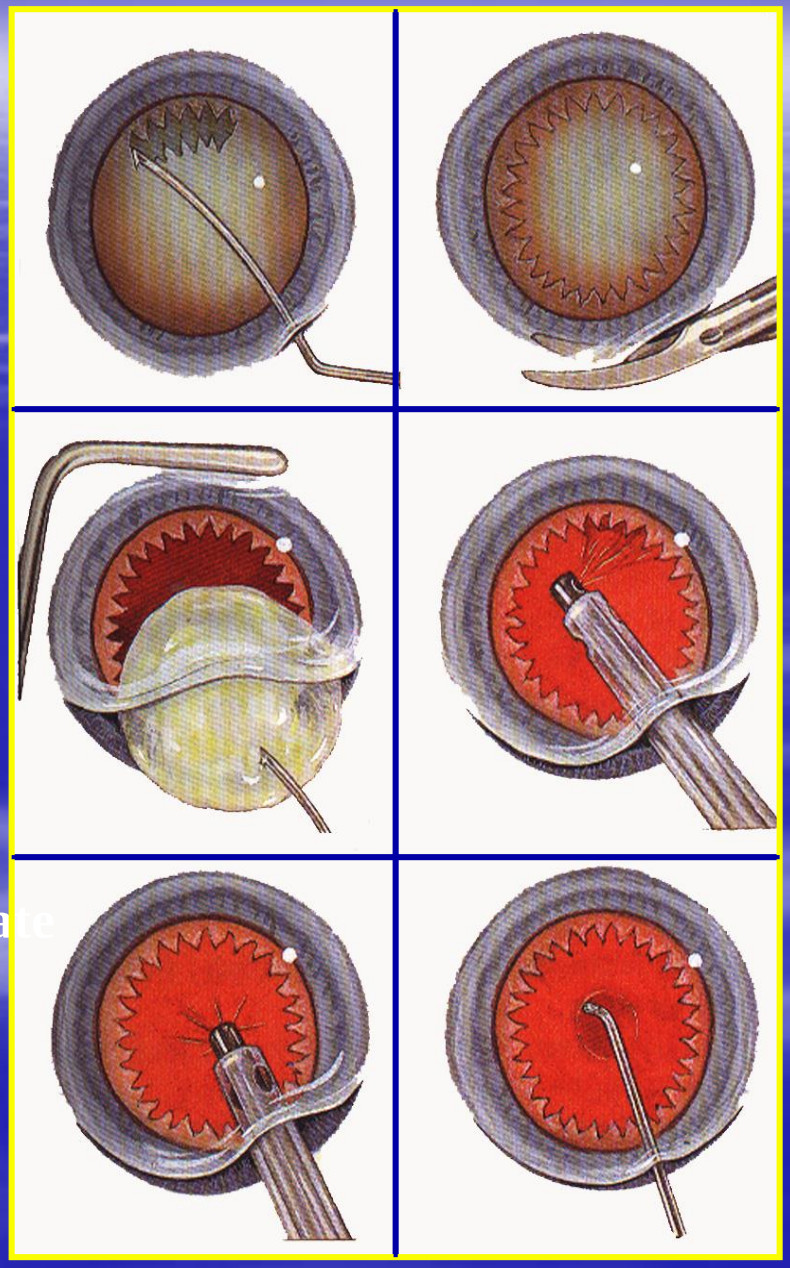
Hypermature



Morgagnian

Extracapsular cataract extraction

1. Anterior capsulotomy



2. Completion of incision

3. Expression of nucleus

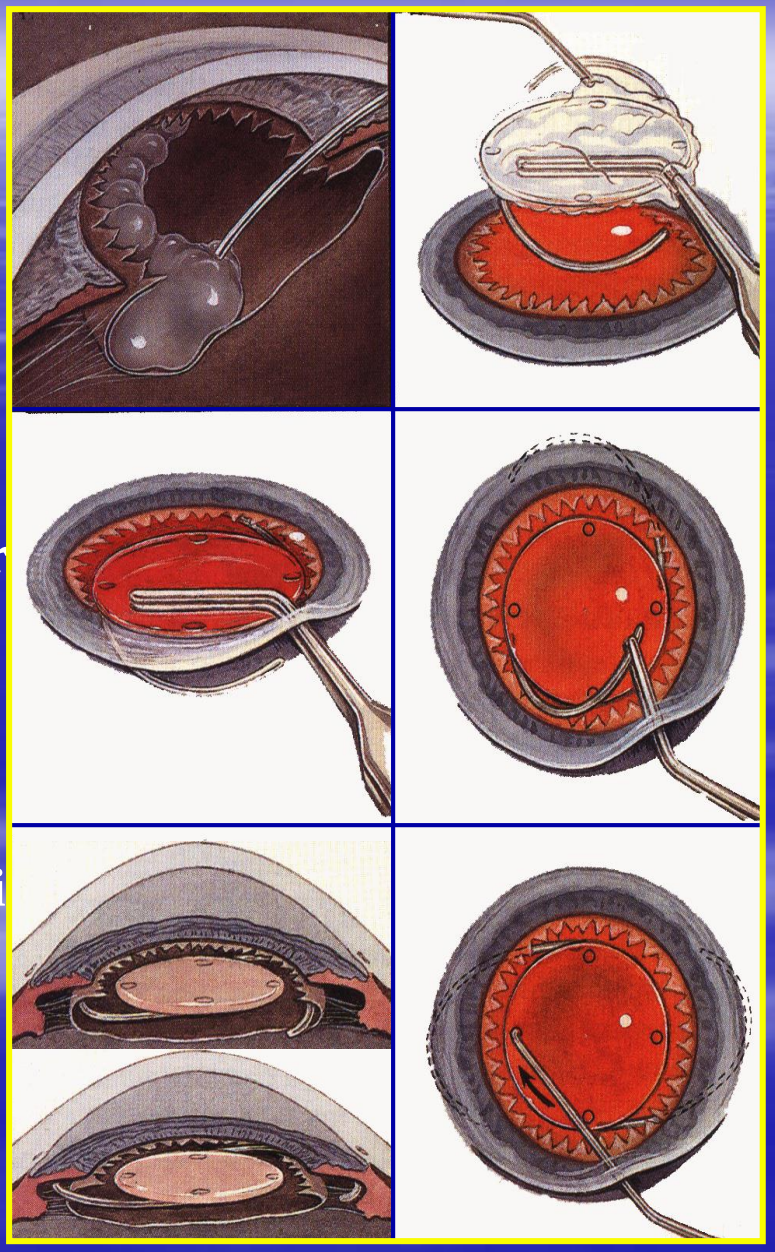
4. Cortical cleanup

5. Care not to aspirate posterior capsule accidentally

6. Polishing of posterior capsule, if appropriate

Extracapsular cataract extraction (cont.)

7. Injection of viscoelastic substance



8. Grasping of IOL And coating with Viscoelastic substance

9. Insertion of inferior haptic and optic

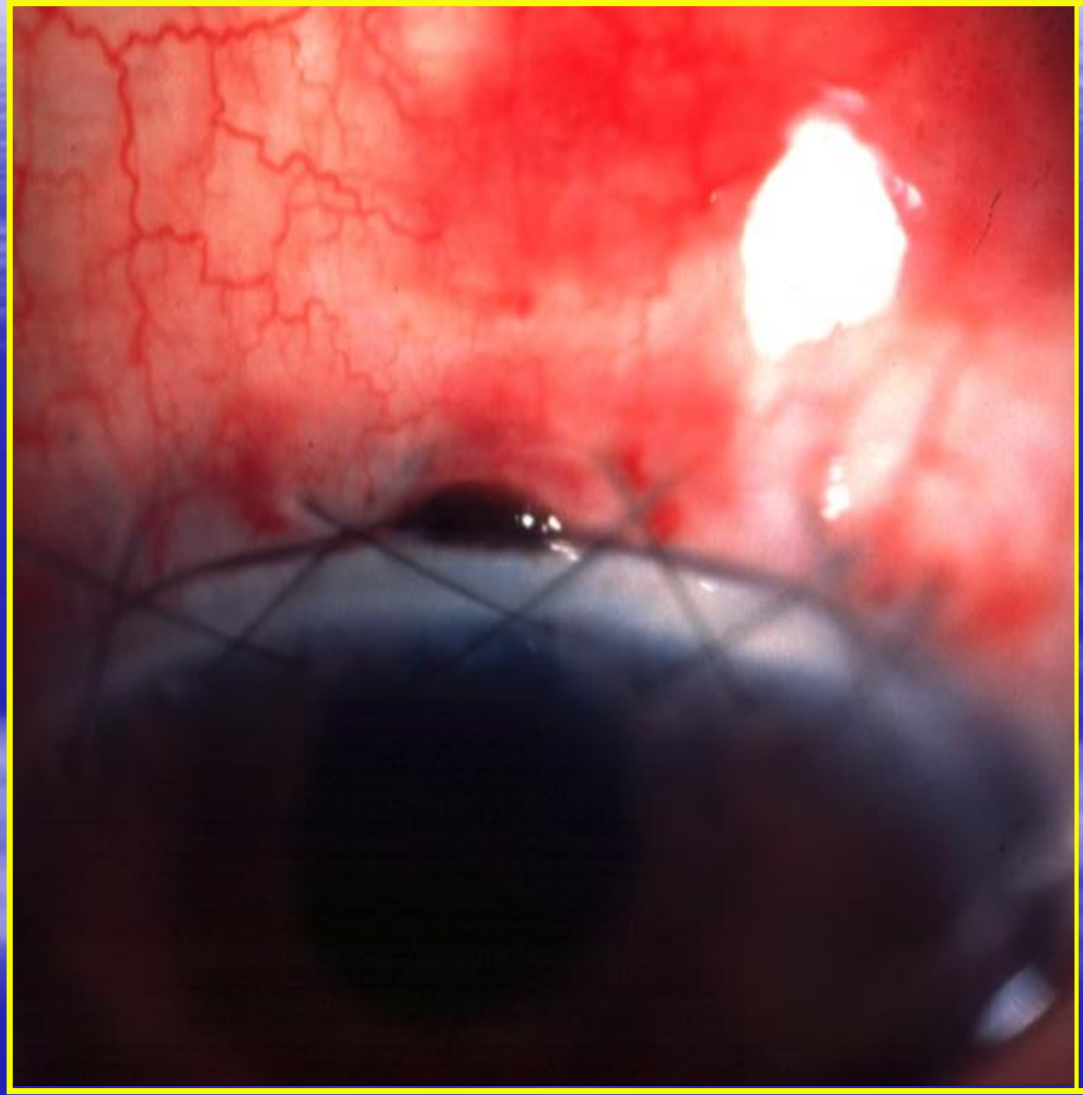
10. Insertion of superior haptic

11. Placement of hapti into capsular bag and not into Ciliary sulcus

12. Dialling of IOL into horizontal position

Early postoperative complications

Iris prolapse



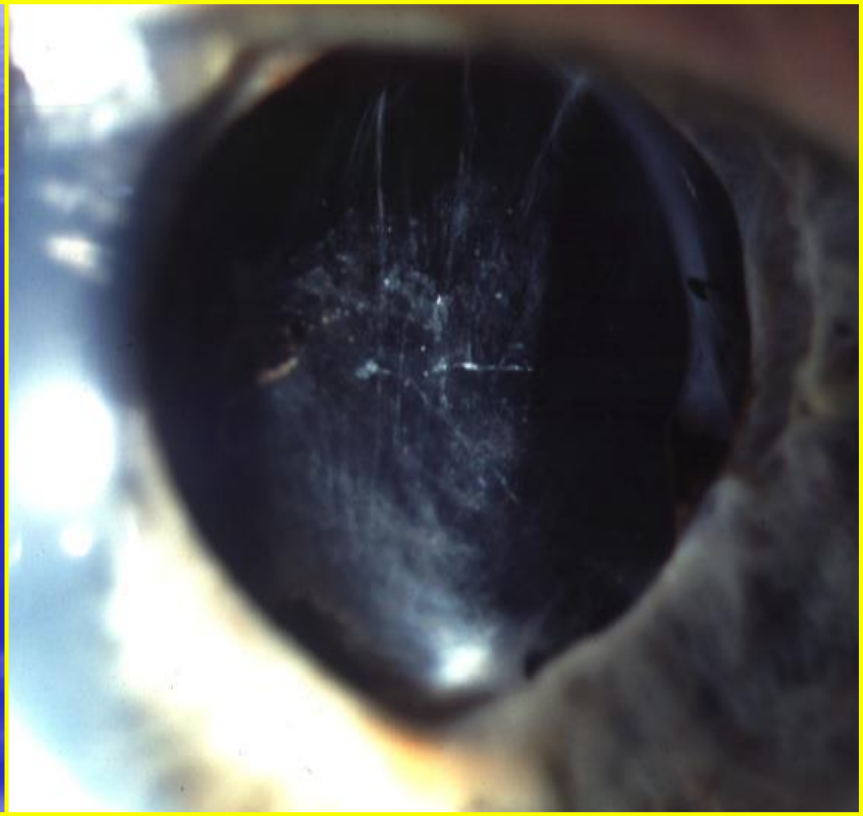
Cause

- Usually inadequate suturing of incision
- Most frequently follows inappropriate management of vitreous loss

Treatment

- Excise prolapsed iris tissue
- Resuture incision

Capsular Opacification



- Proliferation of lens epithelium
- Occurs after 3-5 years

Acute bacterial endophthalmitis

Incidence - about 1:1,000

Common causative organisms

- *Staph. epidermidis*
- *Staph. aureus*
- *Pseudomonas* sp.

Source of infection

- Patient's own external bacterial flora is most frequent culprit
- Contaminated solutions and instruments
- Environmental flora includin that of surgeon and operating room personnel

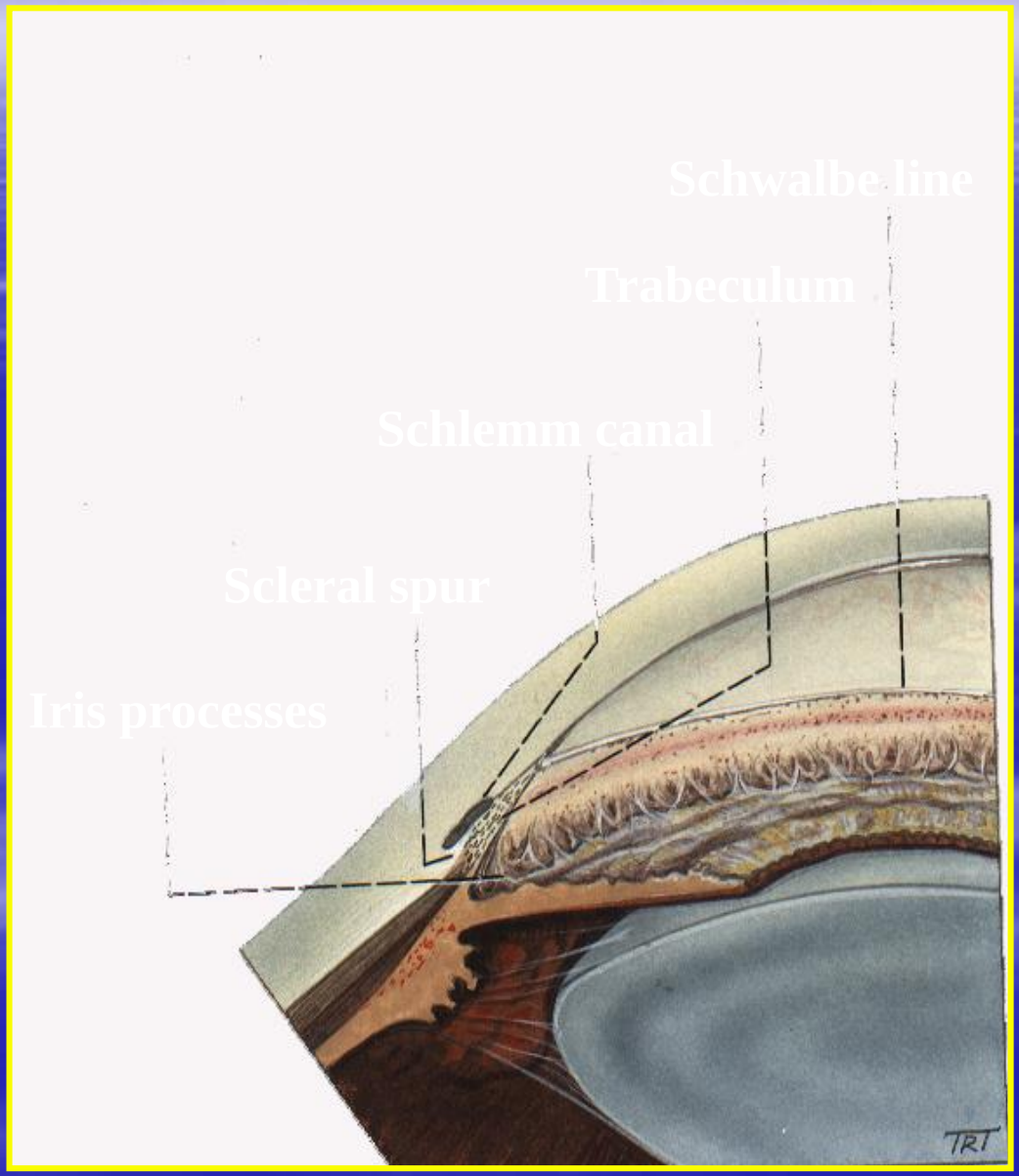
ECTOPIA LENTIS

1. Acquired
2. Isolated familial ectopia lentis
3. Associated with systemic syndromes
   - Marfan syndrome
   - Weill-Marchesani syndrome
   - Homocystinuria
4. Treatment options

Sublaxated Lens (Ectopia Lentis)

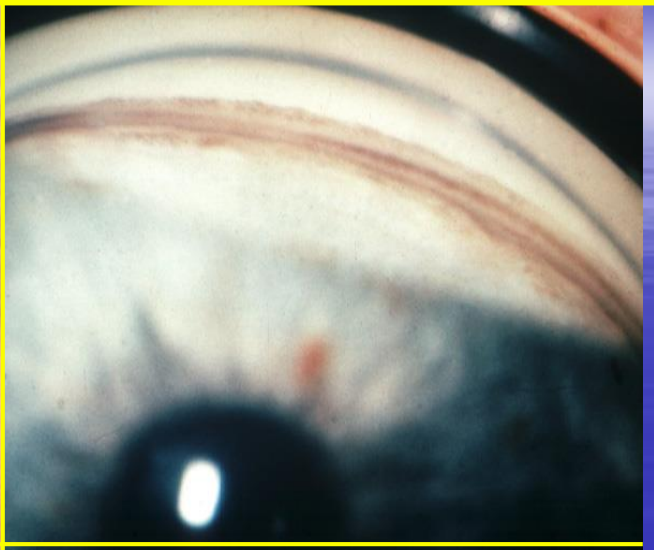
GLAUCOMA

Angle structures

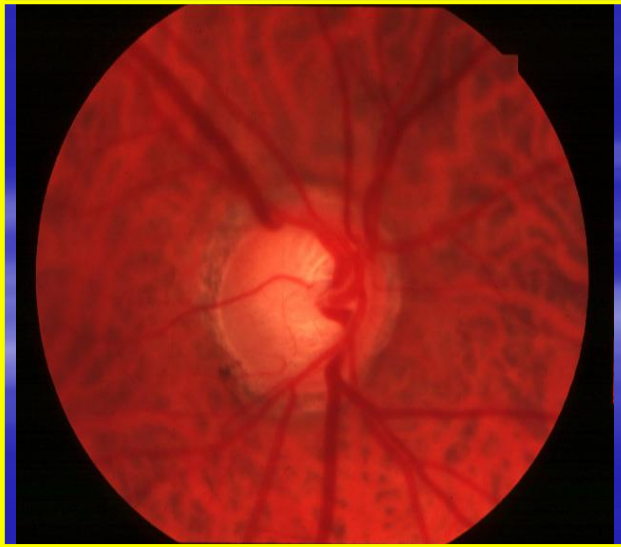


Primary Open Angle Glaucoma

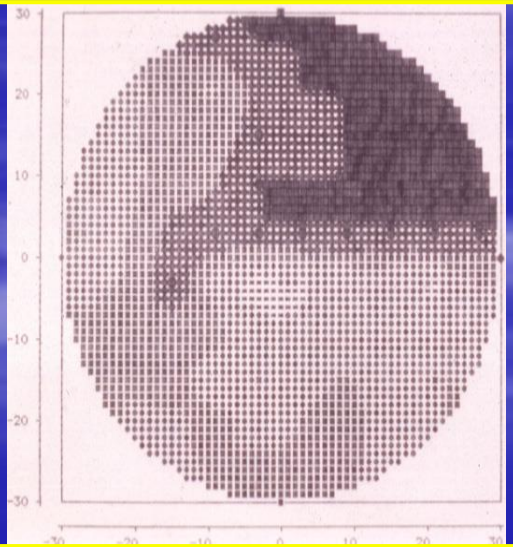
IOP > 21 mmHg



Open angle of normal appearance

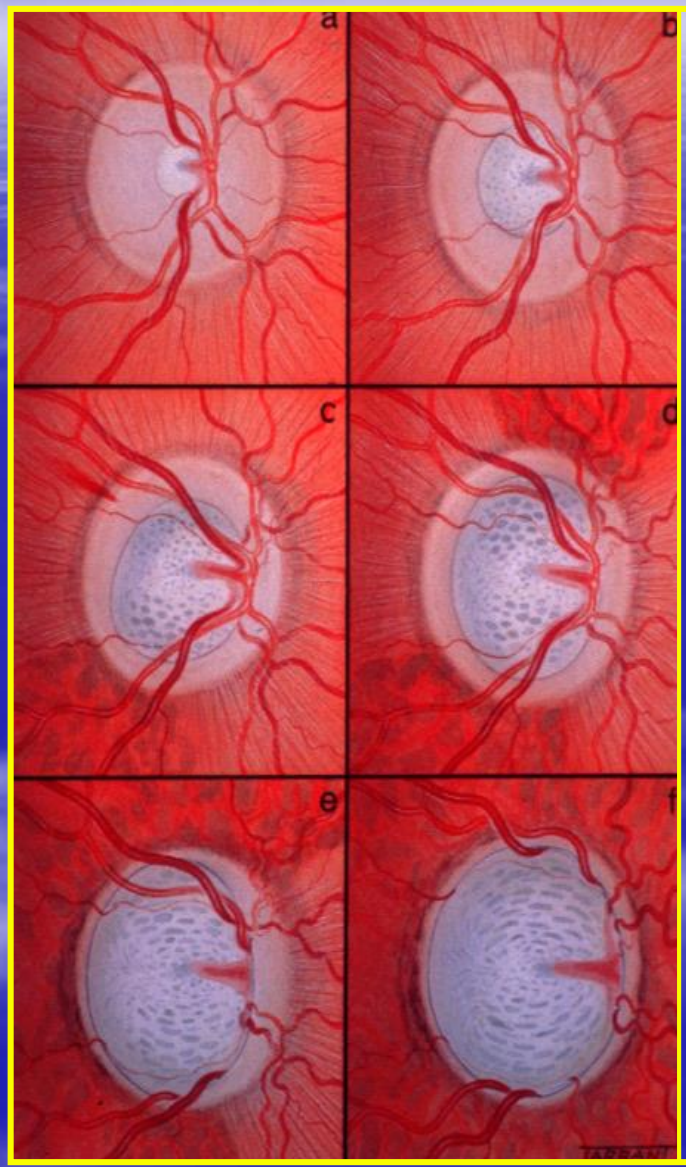


Glaucomatous disc damage



Visual field loss

Progression of glaucomatous cupping



a. Normal (c:d ratio 0.2)

b. Concentric enlargement (c:d ratio 0.5)

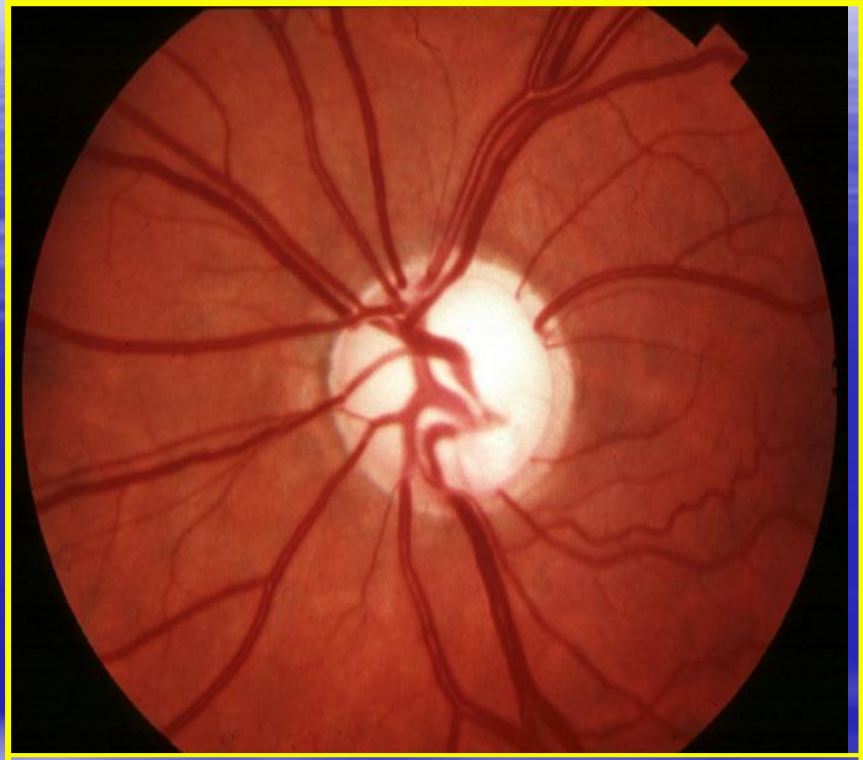
c. Inferior expansion with retinal nerve fibre loss

d. Superior expansion with retinal nerve fibre loss

e. Advanced cupping with nasal displacement of vessels

f. Total cupping with loss of all retinal nerve fibres

End-stage damage



- All neural disc tissue is destroyed
- Disc is white and deeply excavated

- Atrophy of all retinal nerve fibres
- Striations are absent
- Blood vessels appear dark and sharply defined

Signs of postcongestive angle-closure glaucoma

- Folds in Descemet membrane

Stromal iris atrophy with spiral-like configuration

- Posterior synechiae
- Fine pigment on iris

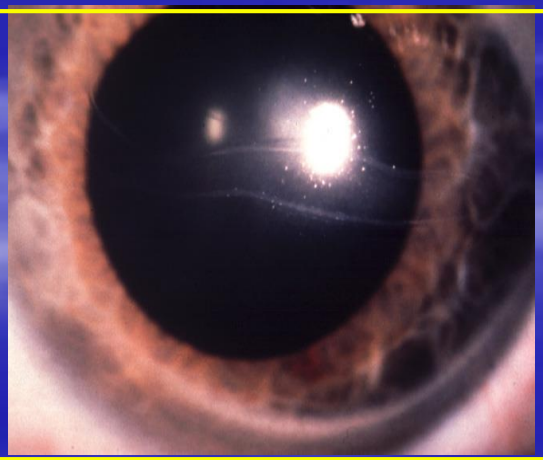
- Fixed dilated pupil
- Glaukomflecken

Clinical features of primary congenital glaucoma

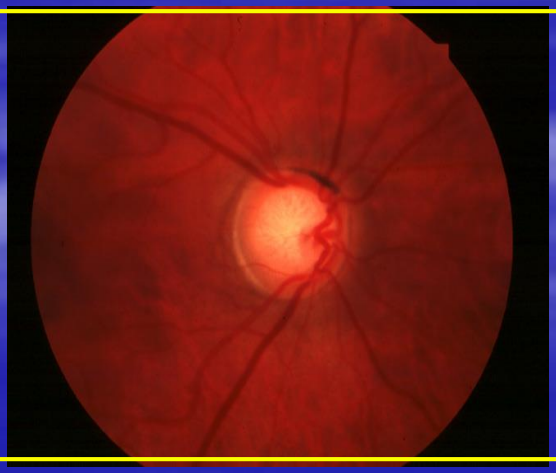
- Depend on age of onset
- Bilateral in 75% but frequently asymmetrical

Corneal oedema associated with lacrimation and photophobia

Buphthalmos if IOP becomes elevated prior to age 3 years.

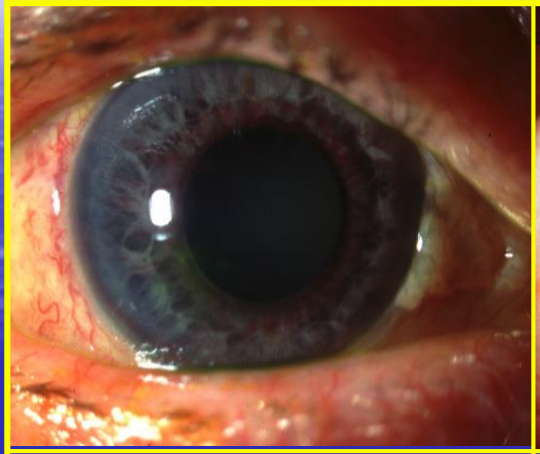


Breaks in Descemet membrane



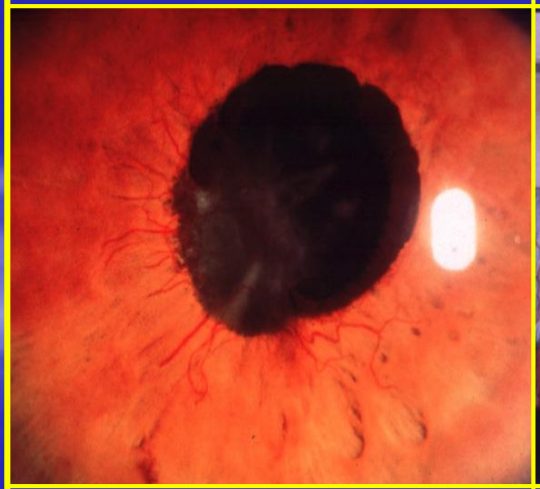
Optic disc cupping

Neovascular Glaucoma (Rubeosis Iridis)



Severely reduced visual acuity, congestion and pain

Severe rubeosis iridis

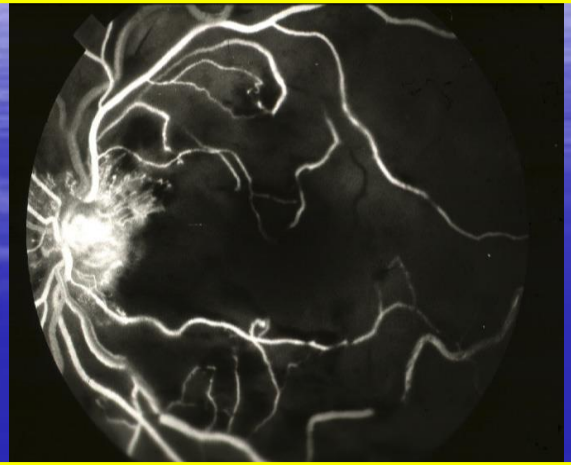


Distortion of pupil and ectropion uveae

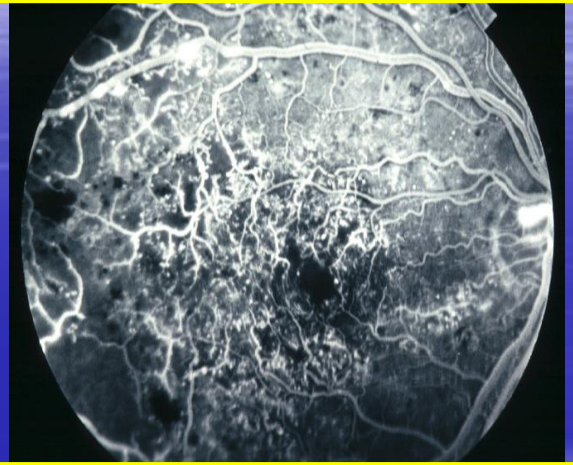
Synechial angle closure

Causes of Neovascular glaucoma

- Common, secondary angle-closure glaucoma



Ischaemic central retinal vein occlusion (most common)



Long-standing diabetes (common)

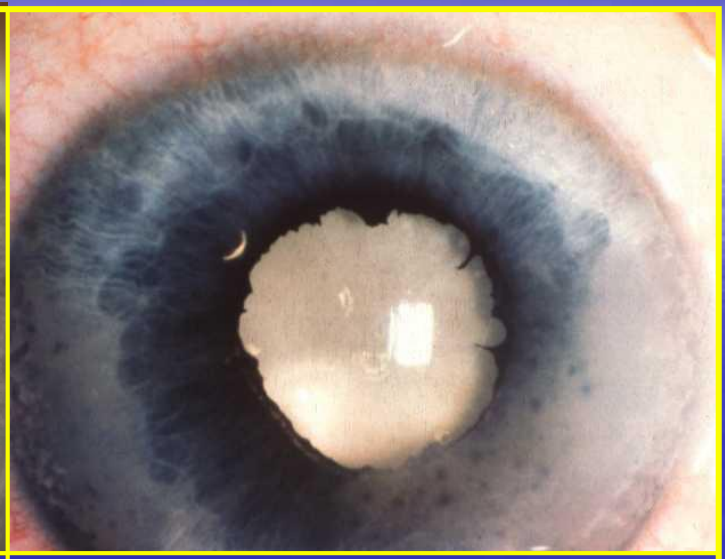
Central retinal artery occlusion (uncommon)

Carotid obstructive disease (uncommon)

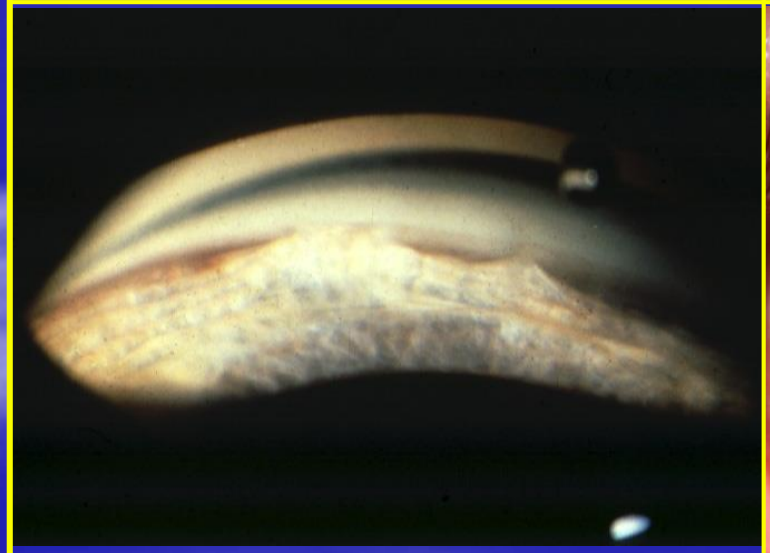
UVEITIS

Complications of Anterior Uveitis

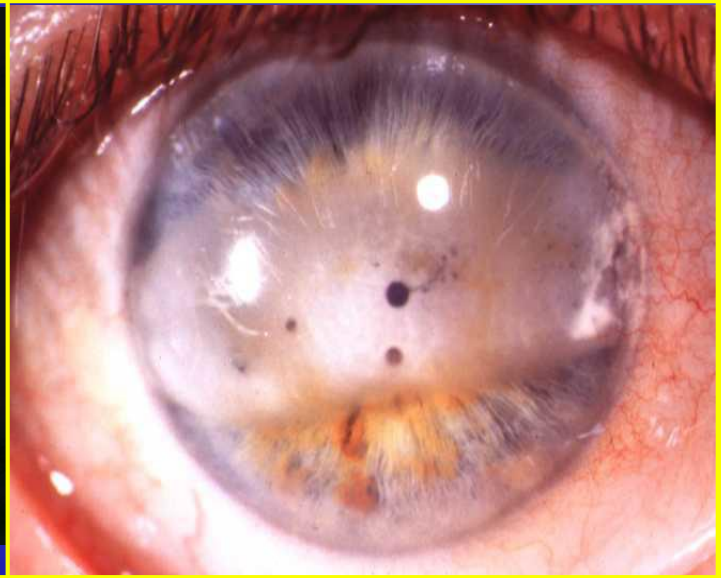
Posterior synechiae - 30%



Cataract -20%



Glaucoma due to PAS - 15%

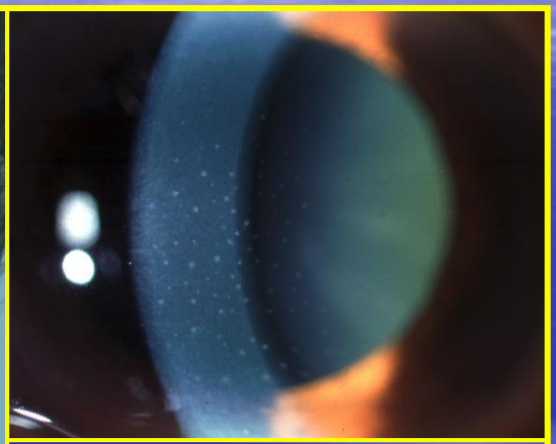


Band keratopathy - 10%

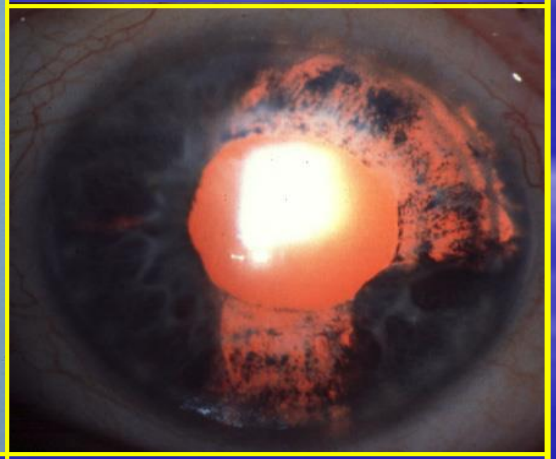
Herpes zoster ophthalmicus

- Iritis in 40% of cases
- Within 3 weeks of onset of rash

Particularly if external nasal branch involved - Hutchinson sign



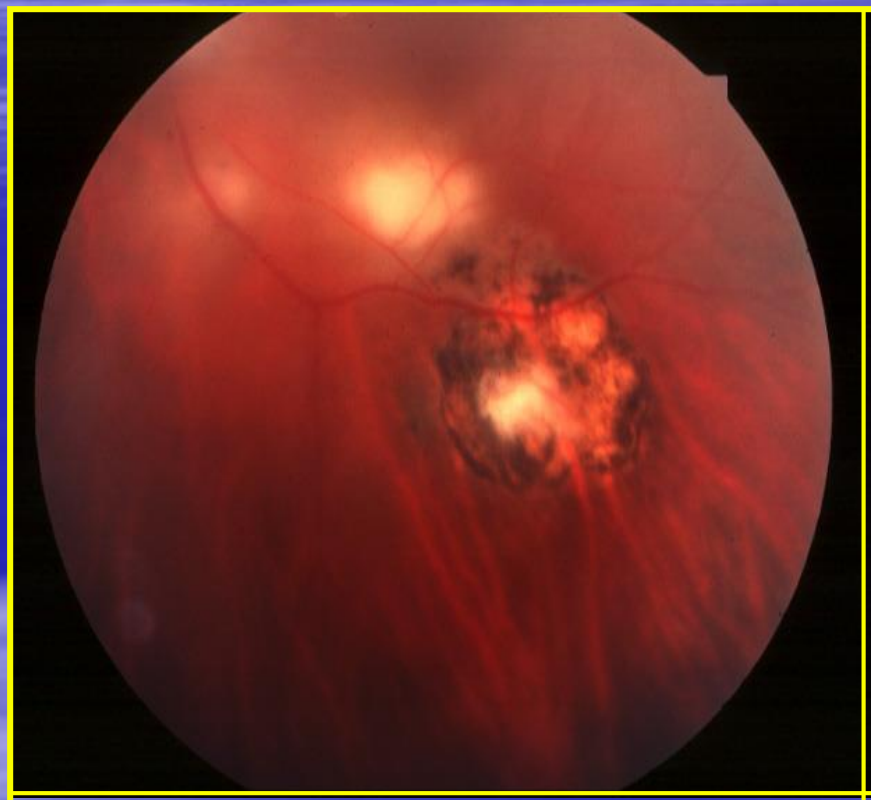
Small-medium KP



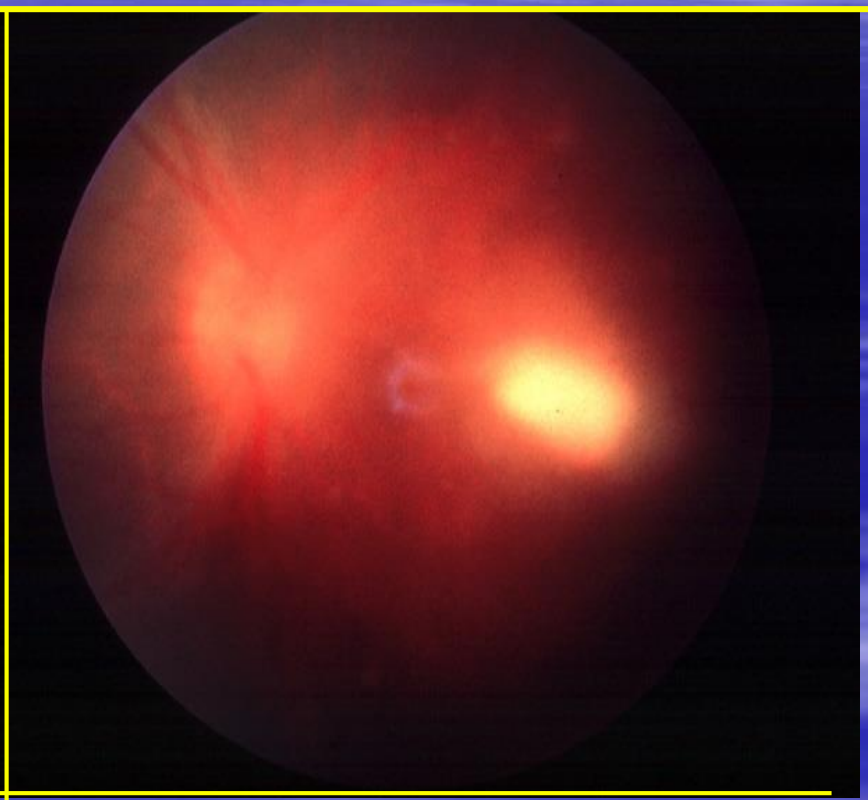
Iris atrophy - 20%

Toxoplasmosis

- Recurrence of healed congenital lesion
- Usually between ages 10-35 years.



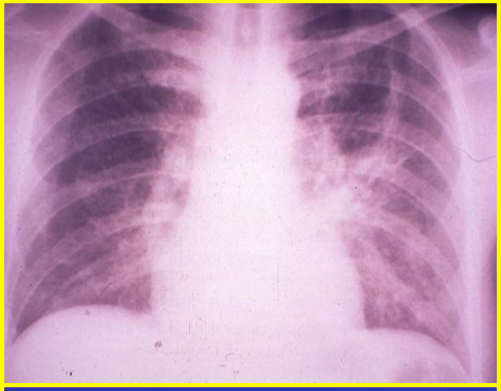
Unifocal retinitis adjacent to old scar
- heals within 1 to 4 months



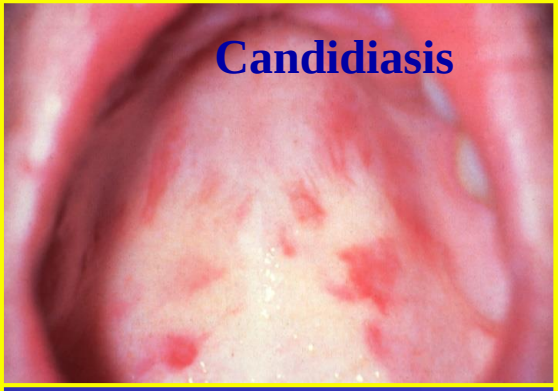
Vitritis may be severe
- 'headlight in fog'

Acquired immune deficiency syndrome (AIDS)

Opportunistic infections



- *Pneumocystis carinii* pneumonia



- Toxoplasmosis
- Atypical mycobacterium
- Cytomegalovirus
- Cryptococcus

Neoplasms

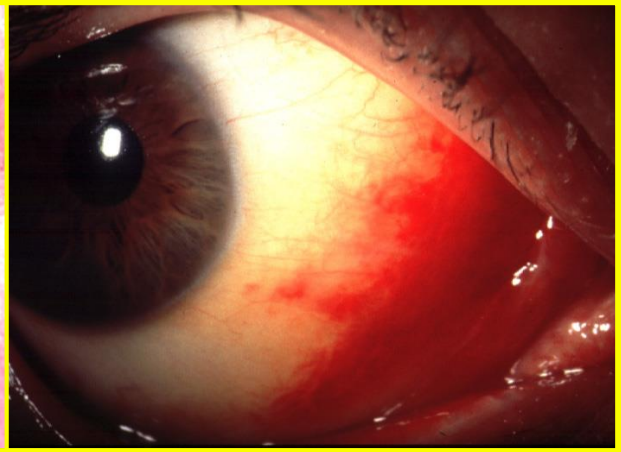
- Kaposi sarcoma

- Lymphoma

Anterior features

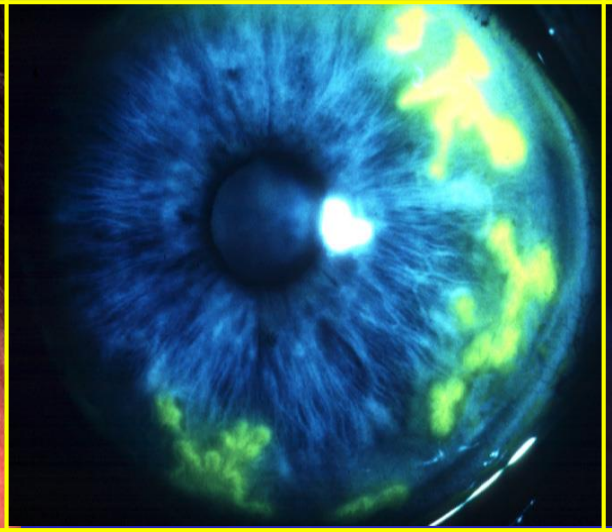
Multiple molluscum contagiosum

Eyelid Kaposi sarcoma

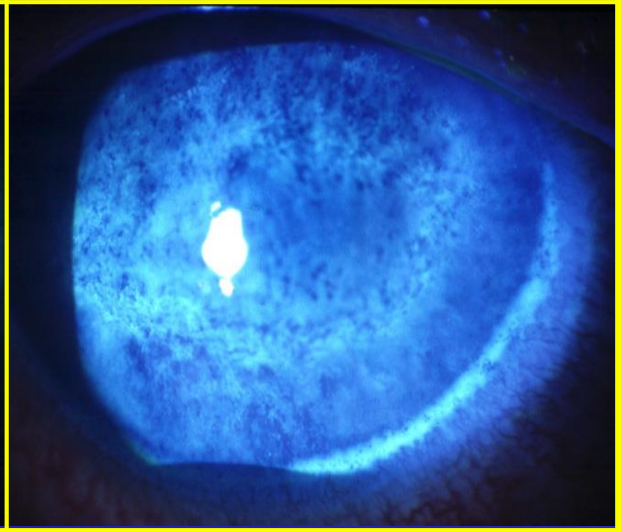


Conjunctival Kaposi sarcoma

Severe herpes zoster ophthalmicus

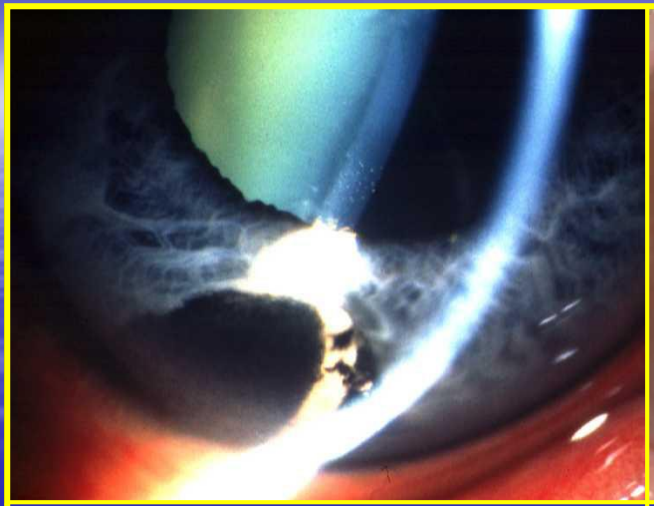


Peripheral herpes simplex keratitis



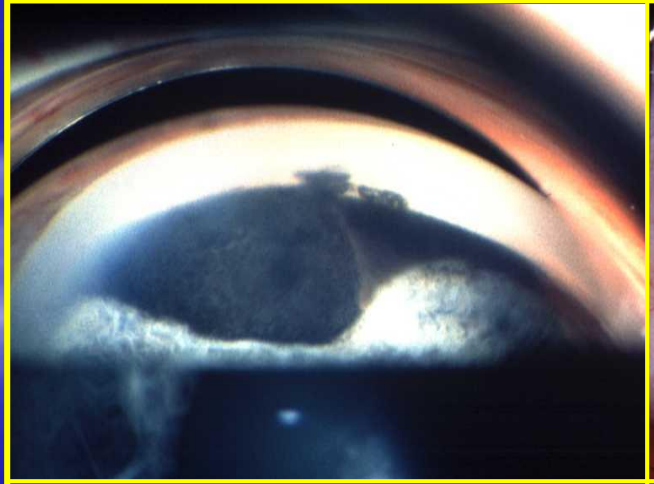
Microsporidial keratitis

Iris melanoma

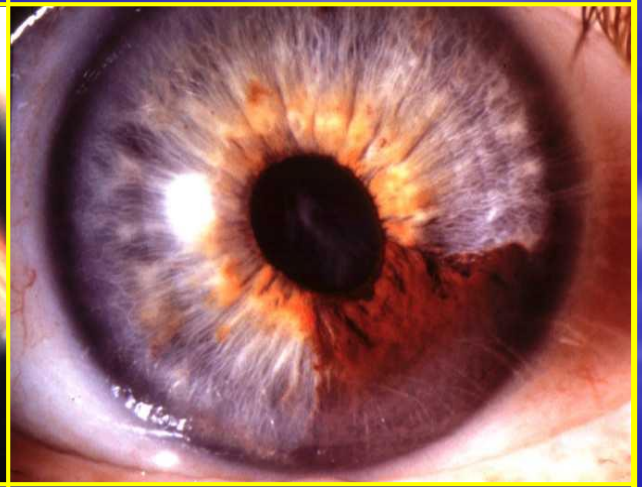


- Usually pigmented nodule at least 3 mm in diameter
- Invariably in inferior half of iris

- Occasionally non-pigmented
- Surface vascularization

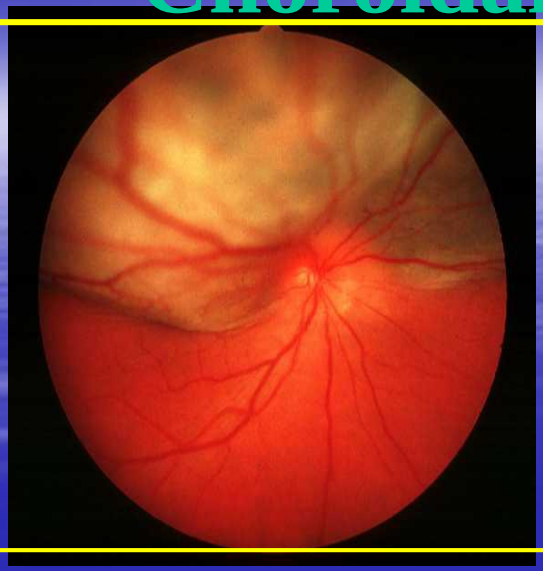


- Angle involvement may cause glaucoma

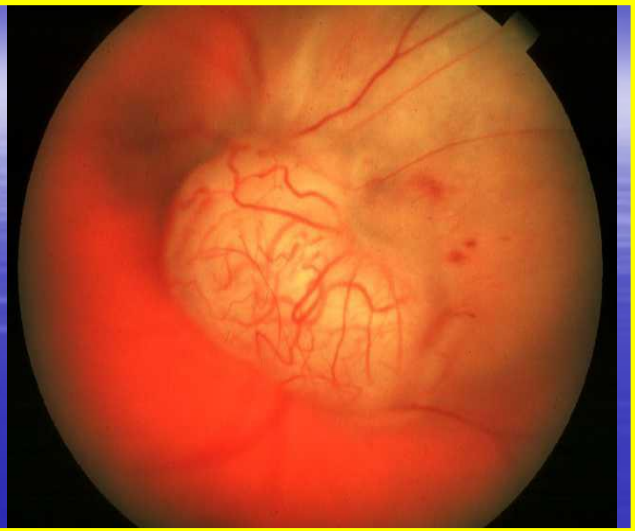


- Pupillary distortion, ectropion uveae and cataract

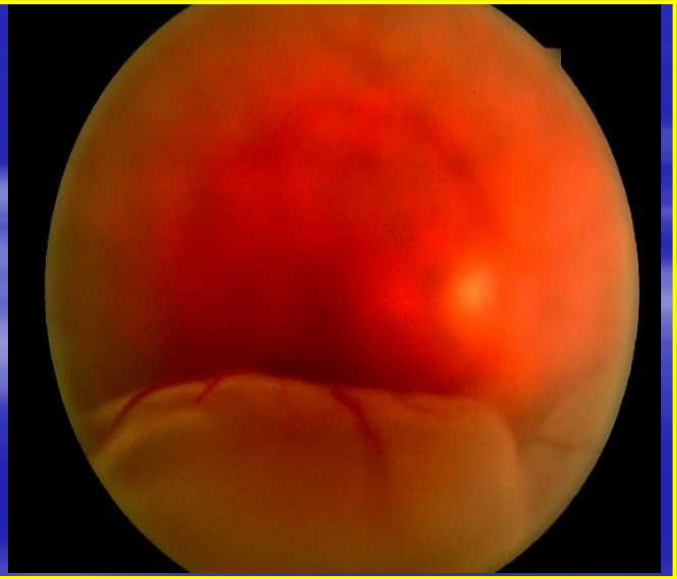
Choroidal melanoma



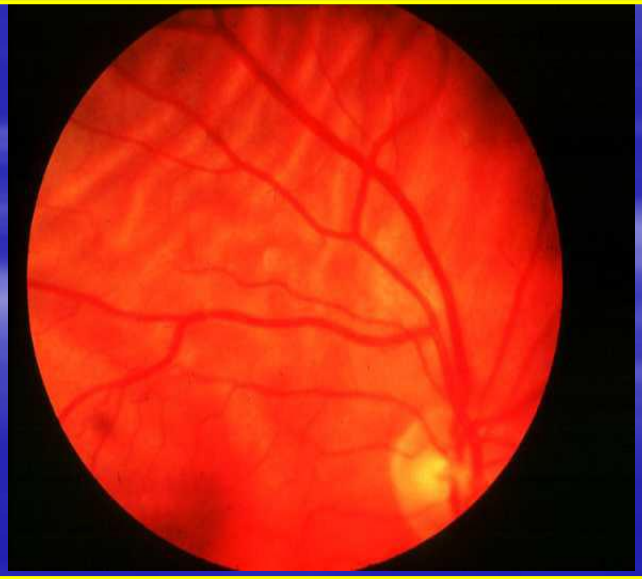
- Brown, elevated, subretinal mass



- Occasionally amelanotic
- Double circulation



- Secondary retinal detachment



- Choroidal folds

Choroidal melanoma

- Surface orange pigment (lipofuscin) is common
- Mushroom-shaped if breaks through Bruch's membrane

- Ultrasound - acoustic hollowness, choroidal excavation and orbital shadowing

RETINA

DIABETIC RETINOPATHY

1. **Background diabetic retinopathy**
2. **Pre-proliferative diabetic retinopathy**
3. **Proliferative diabetic retinopathy**
4. **Diabetic Maculopathies**
   - **Focal**
   - **Diffuse**
   - **Ischaemic**

Background diabetic retinopathy

Microaneurysms usually temporal to fovea

Intraretinal dot and blot haemorrhages

Hard exudates frequently arranged in clumps or rings

Retinal oedema seen as thickening on biomicroscopy

Preproliferative diabetic retinopathy

Signs

- Cotton-wool spots
- Venous irregularities

- Dark blot haemorrhages
- Intraretinal microvascular abnormalities (IRMA)

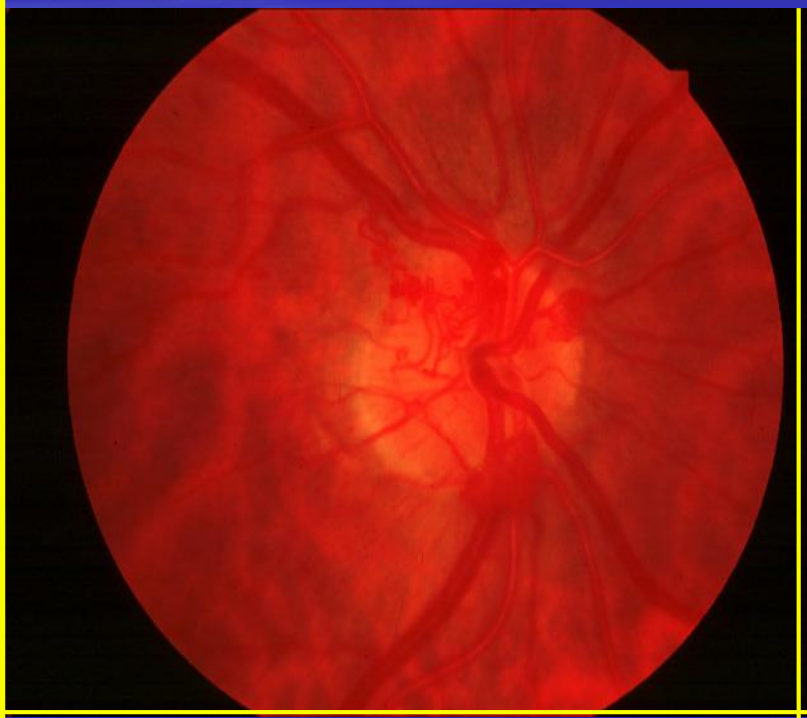
Treatment - not required but watch for proliferative disease

Proliferative diabetic retinopathy

- Affects 5-10% of diabetics
- IDD at increased risk (60% after 30 years)

Neovascularization

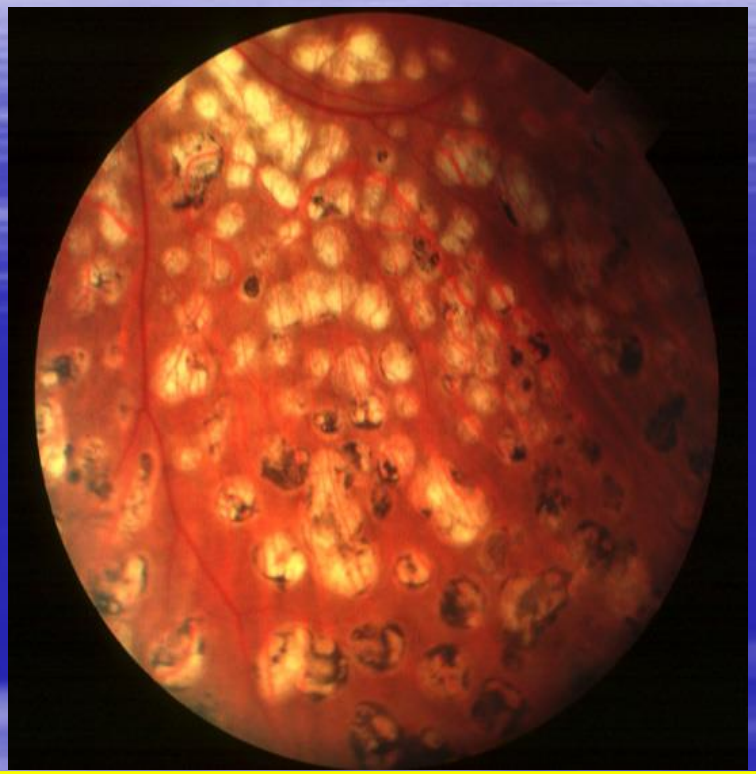
- Flat or elevated

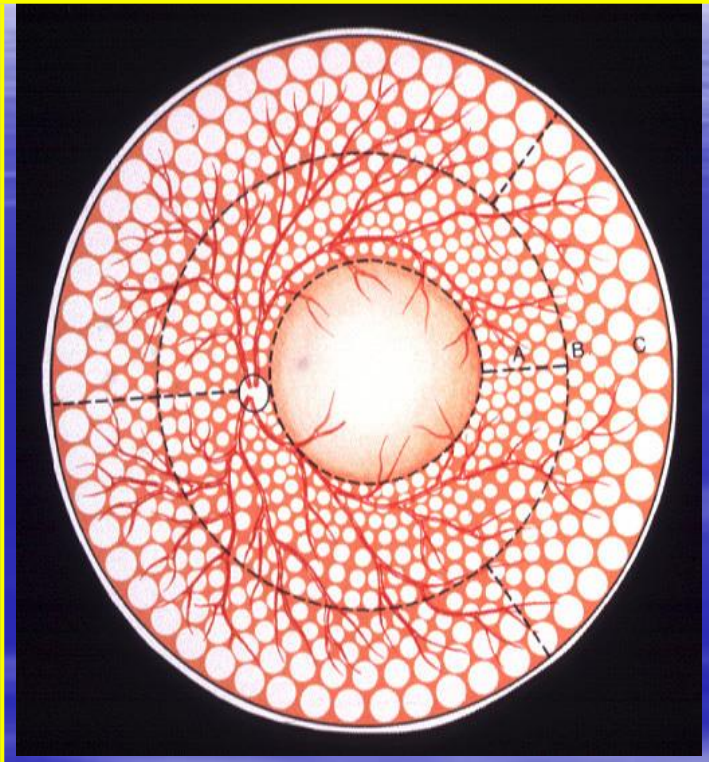


Neovascularization of disc = NVD

Neovascularization elsewhere = NVE

Laser panretinal photocoagulation





- Area covered by complete PRP
- Follow-up 4 to 8 weeks

Branch retinal vein occlusion (BRVO)

Signs of acute BRVO

- Venous tortuosity and dilatation
- Flame-shaped and ‘dot-blot’ haemorrhages
- Cotton-wool spots and retinal oedema

Prognosis - VA 6/12 or better after 6 months in 50%

Complications - chronic macular oedema and neovascularization

Central retinal vein occlusion (CRVO)

Signs of CRVO

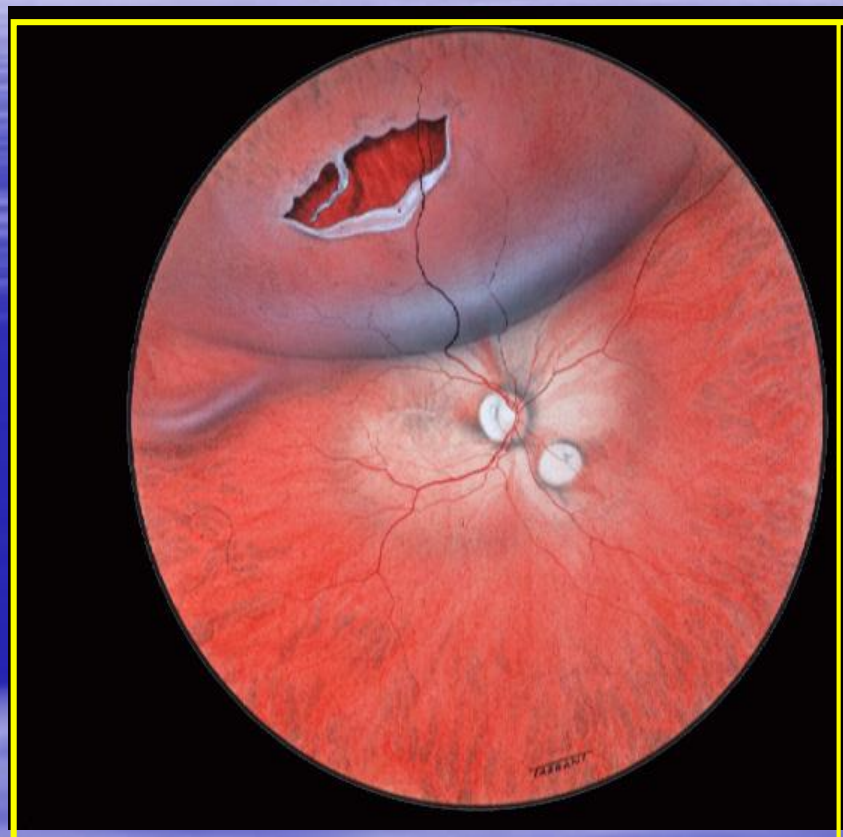
- Venous tortuosity and dilatation
- Retinal haemorrhages
- Cotton-wool spots
- Disc oedema
- Chronic macular oedema

Central retinal artery occlusion (CRAO)

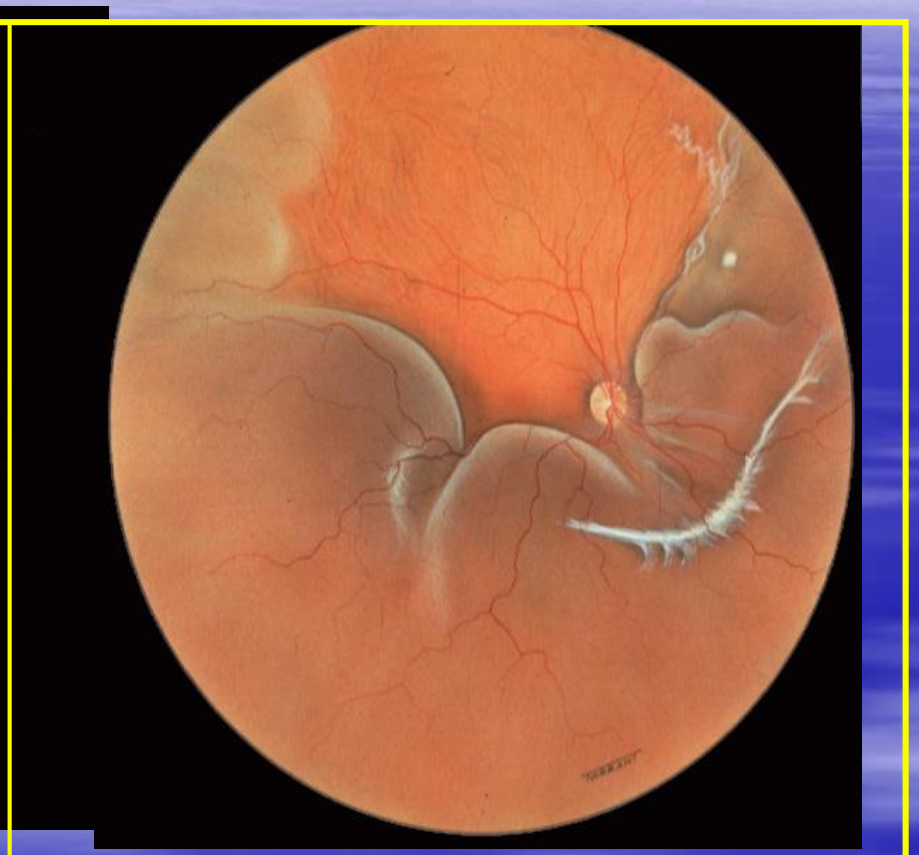
- Retinal whitening
- ‘Cherry-red spot’ at macula
- Arteriolar and venular narrowing
- Sludging and segmentation of blood column (cattle-trucking)
- Very poor prognosis

Retinal detachment (RD)

Separation of sensory retina from RPE by subretinal fluid (SRF)



Rhegmatogenous - caused by a retinal break



Non-rhegmatogenous - tractional or exudative

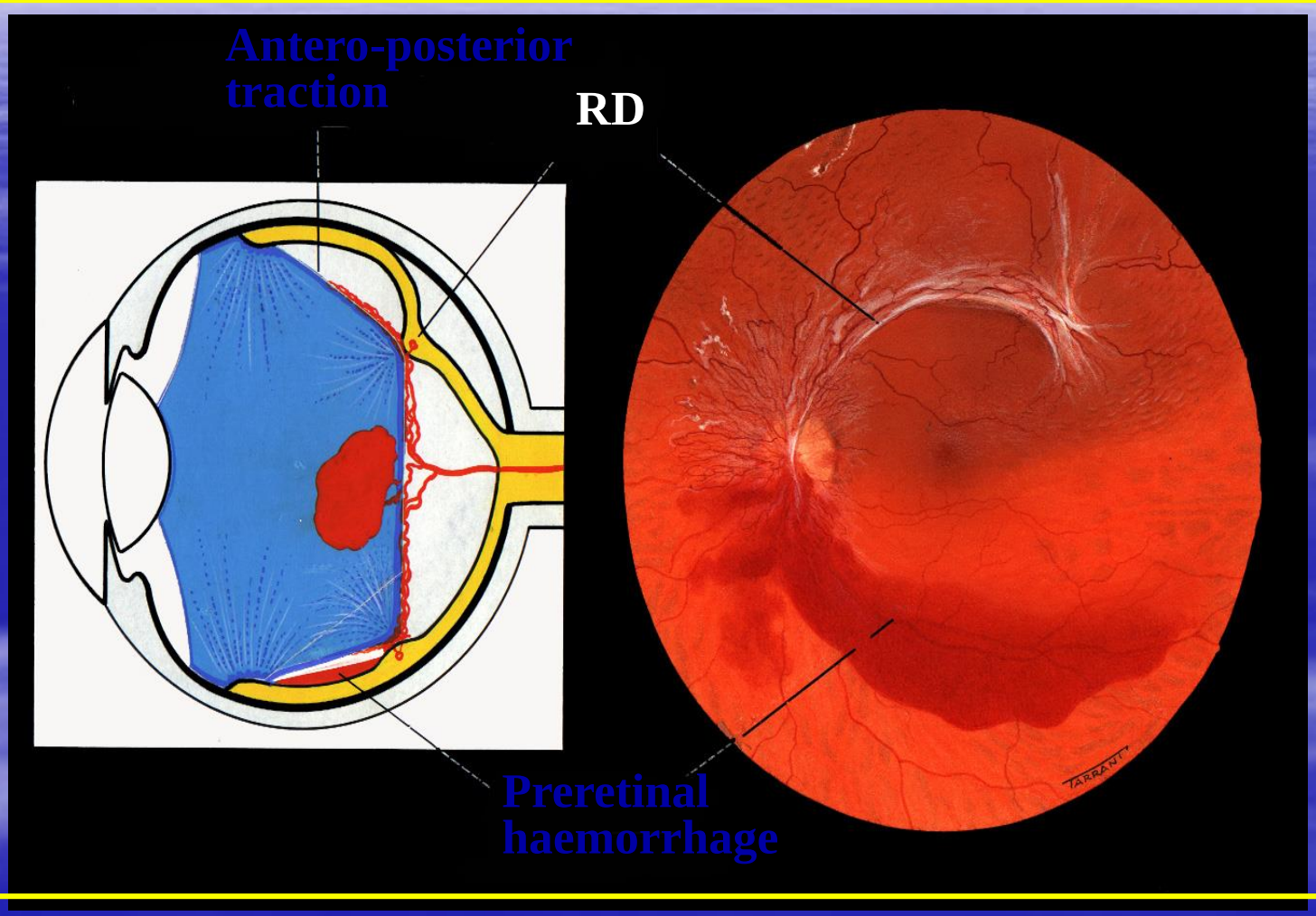
Fresh Rhegmatogenous RD - signs

- Annual incidence - 1:10,000 of population
- Eventually bilateral in 10%

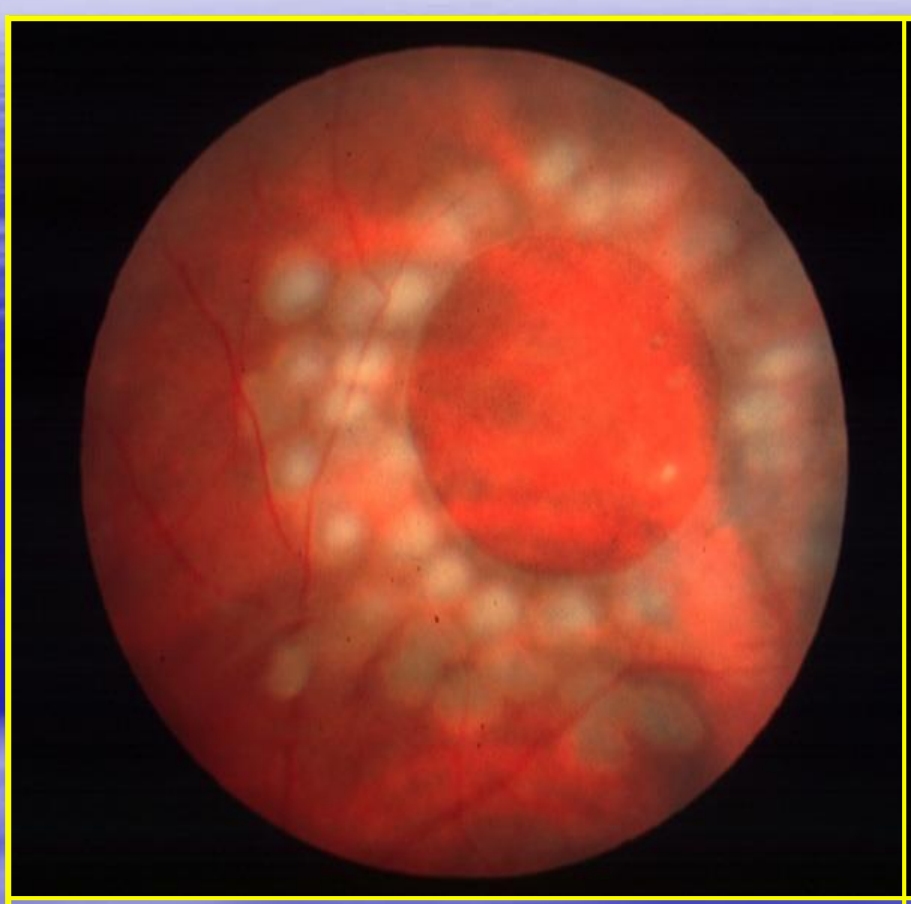
- Convex, deep mobile elevation extending to ora serrata
- Slightly opaque with dark blood vessels

- Loss of choroidal pattern
- Retinal breaks

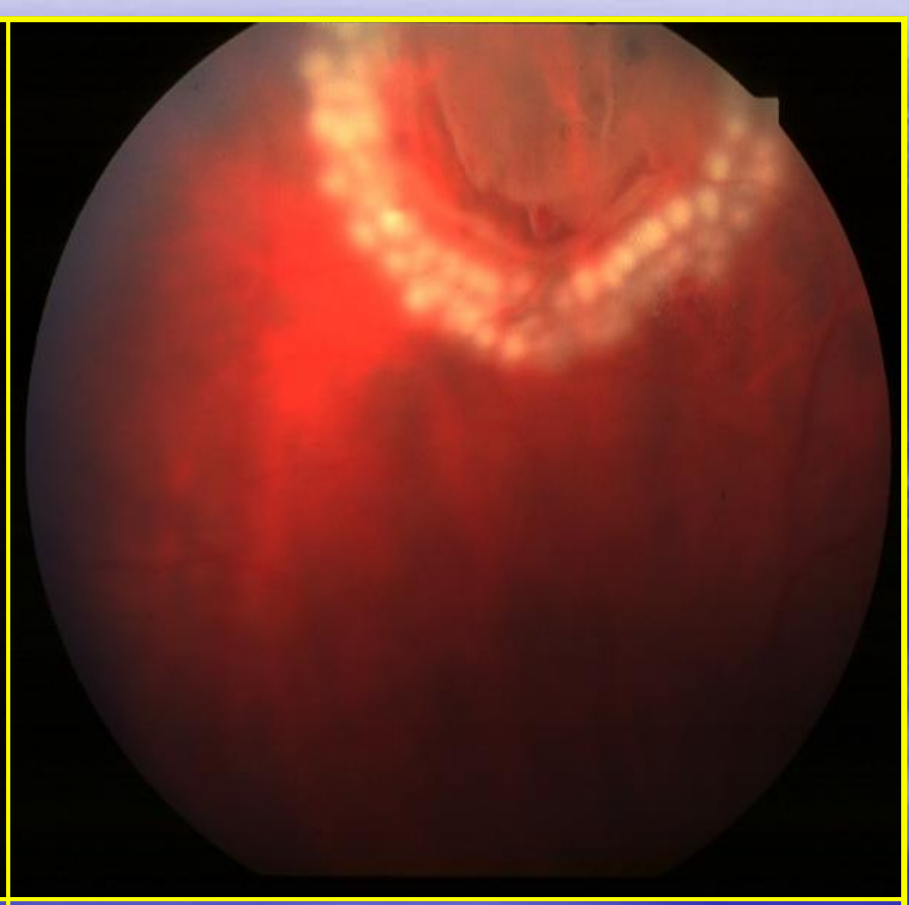
Diabetic Tractional RD



Prophylactic Argon Laser Photocoagulation



Surround lesion with two rows of confluent burns

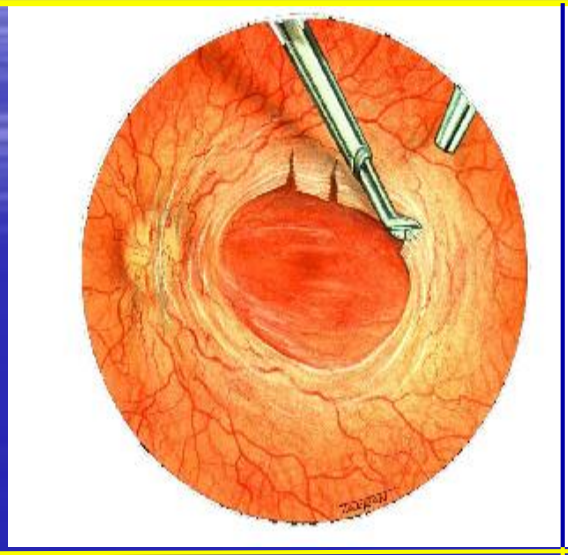


Difficult for anterior lesions and if media hazy

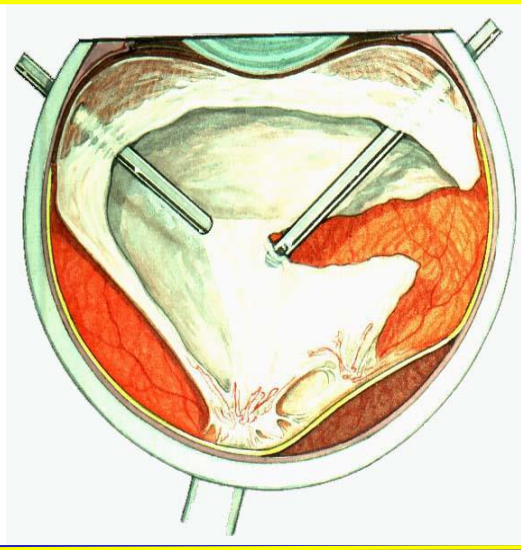
Cryotherapy

- Surround lesion with single row of cryo-applications
- Preferred for treatment of large areas

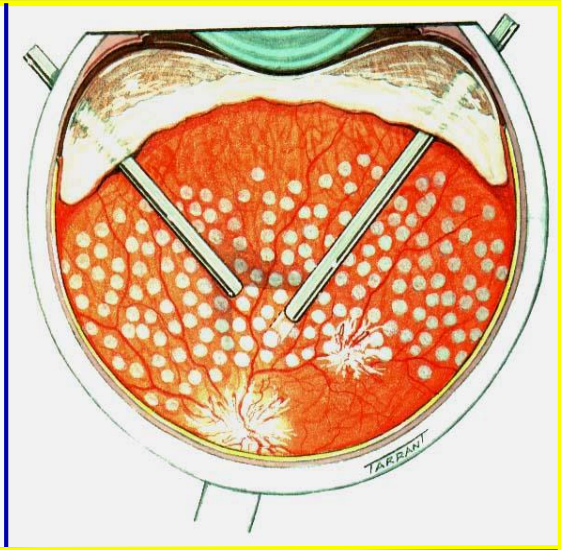
Vitrectomy and Endolaser



Release of circumferential traction

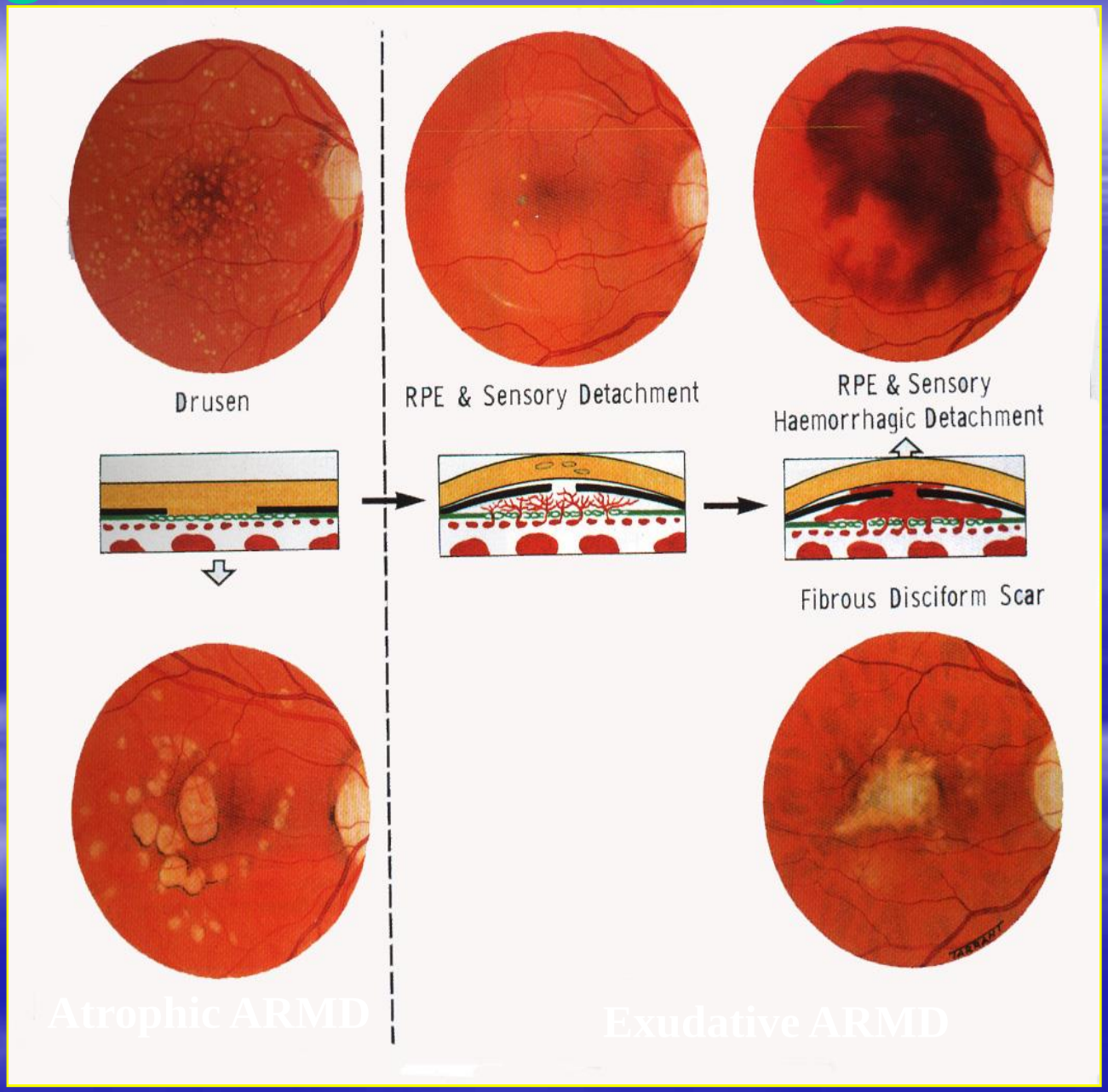


Release of antero-posterior traction

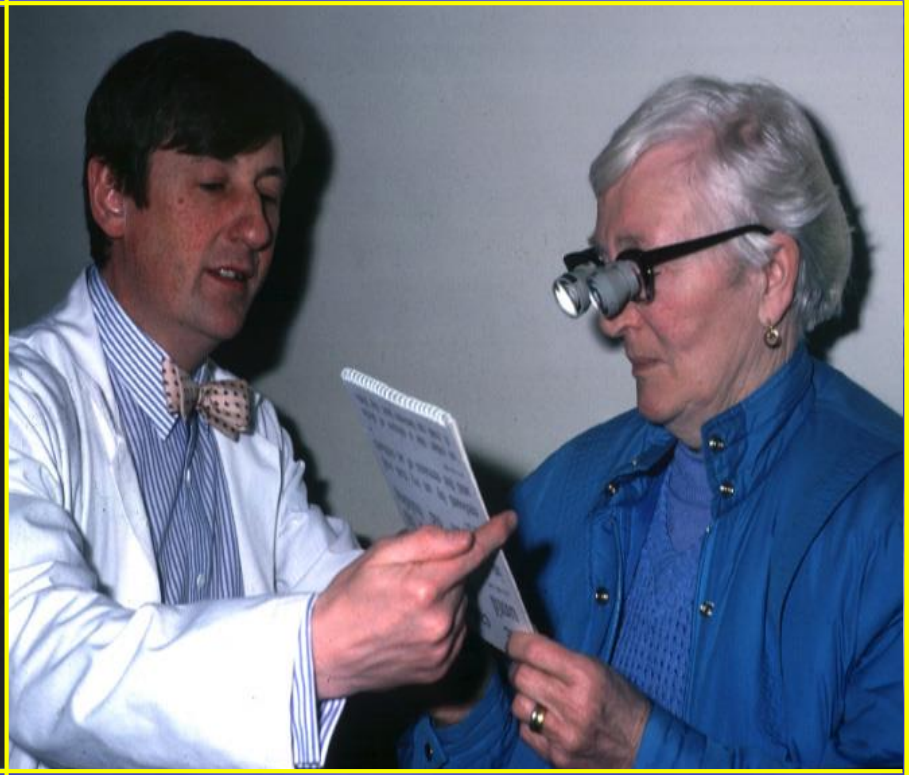


Endophotocoagulation

Age-Related Macular Degeneration

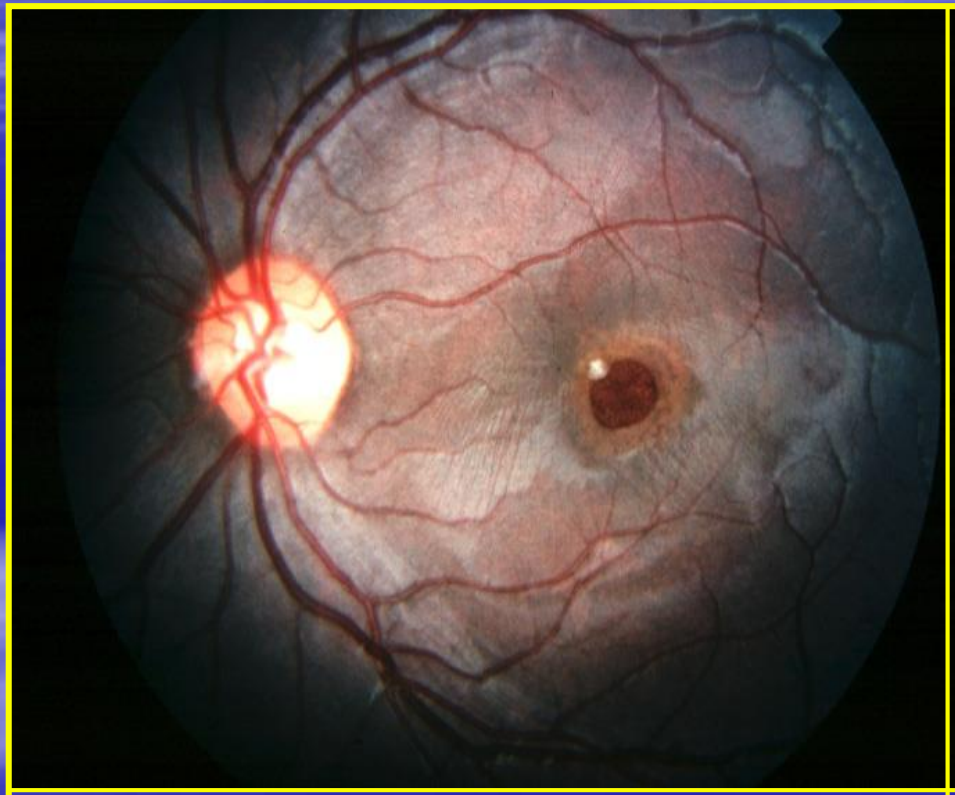


Age-related Macular Degeneration

Fluorescein angiogram	Management
	
Hyperfluorescence	Low-vision aids if appropriate

Clinical features of full-thickness macular hole

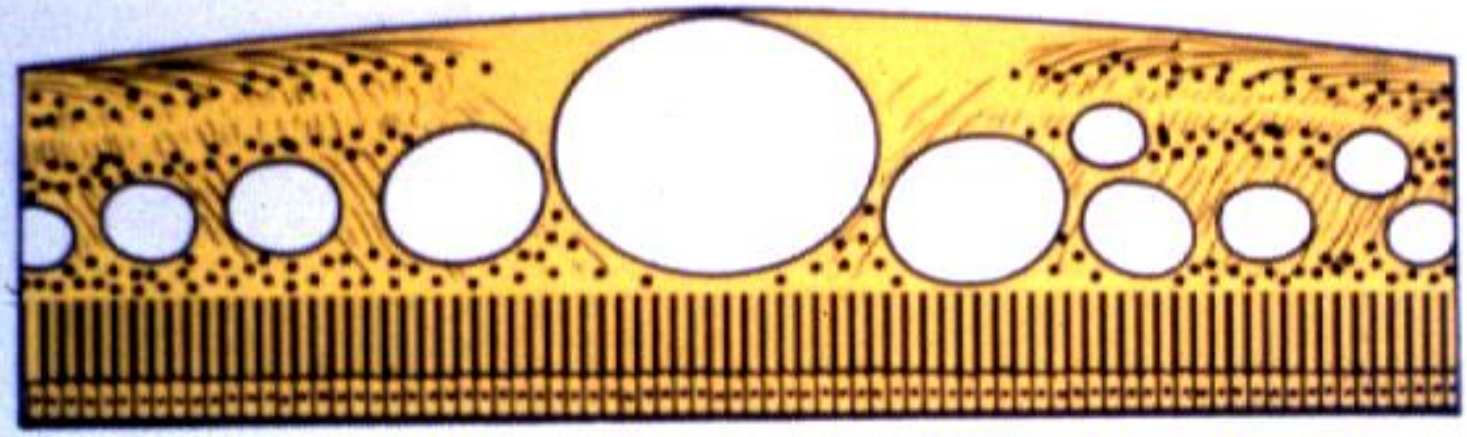
- Typically affects elderly females
- Eventually bilateral in 10%



- Round punched-out area at fovea
- Surrounding halo of sub-retinal fluid

Multiple yellow deposits within crater

Cystoid macular oedema (CMO)

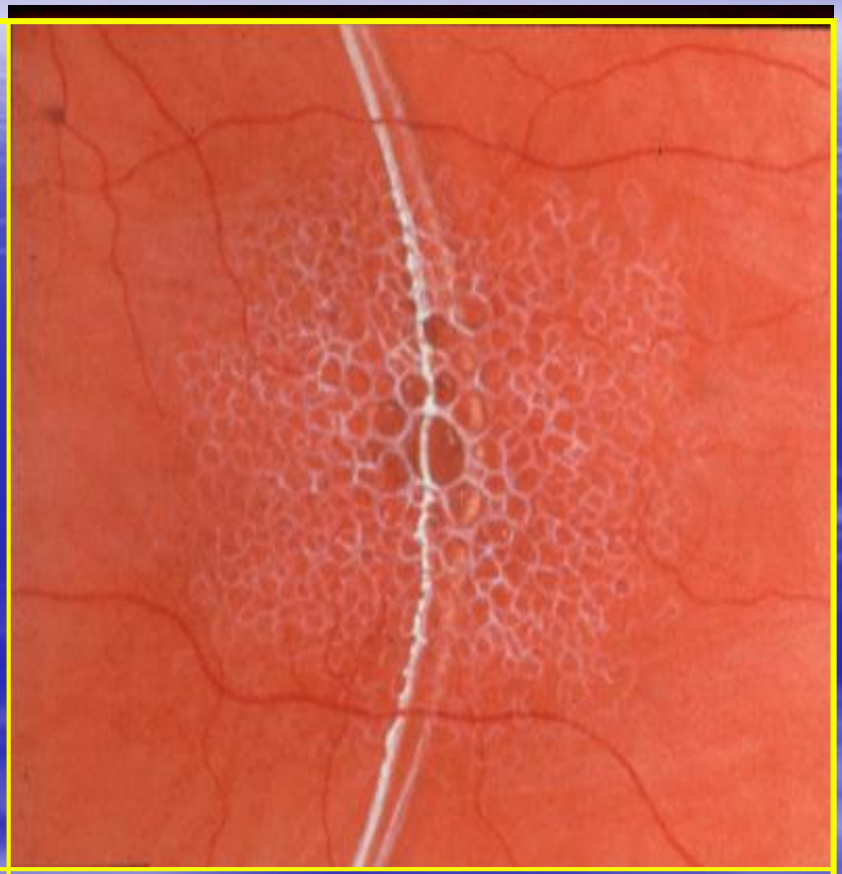


Fluid-filled microcysts in outer plexiform and inner nuclear layer

May lead to lamellar hole formation if longstanding

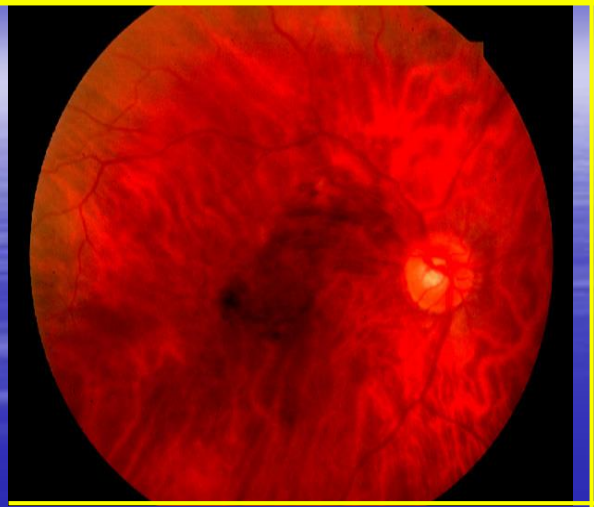
Clinical diagnosis of CMO

- Loss of foveal depression
- Yellow spot at foveola



- Retinal thickening
- Multiple cystoid areas

Important causes of CMO



Retinal vein occlusion

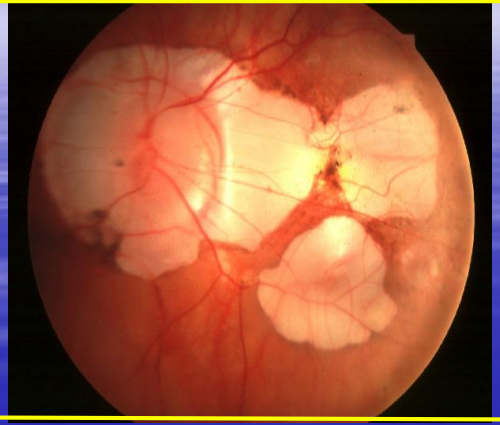
Background diabetic retinopathy

Post-cataract surgery

Intermediate uveitis

Myopic maculopathy

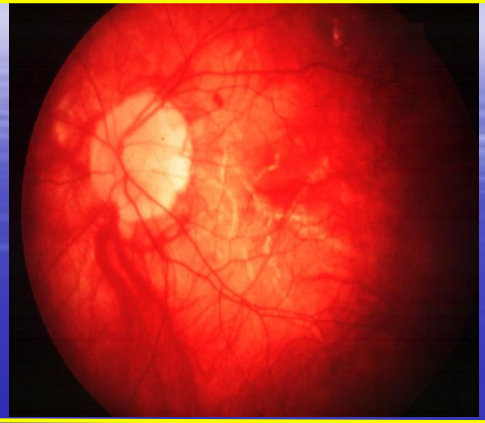
Atrophic



Progressive chorioretinal atrophy

May be associated with macular hole

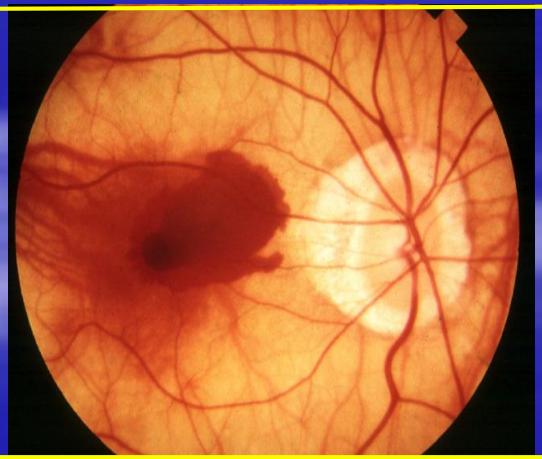
‘Lacquer cracks’



Large breaks in Bruch membrane

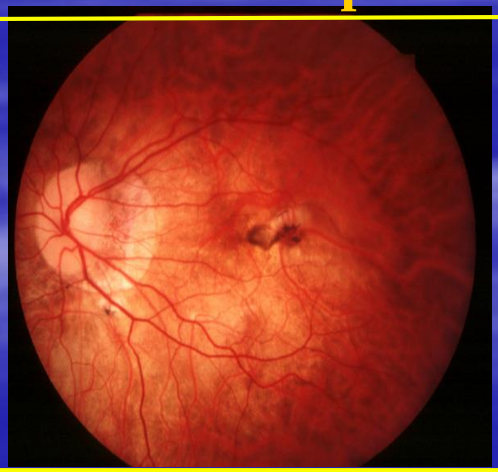
Develop in about 5% of highly myopic eyes

Macular haemorrhage



- From CNV with lacquer cracks
- From lacquer cracks alone

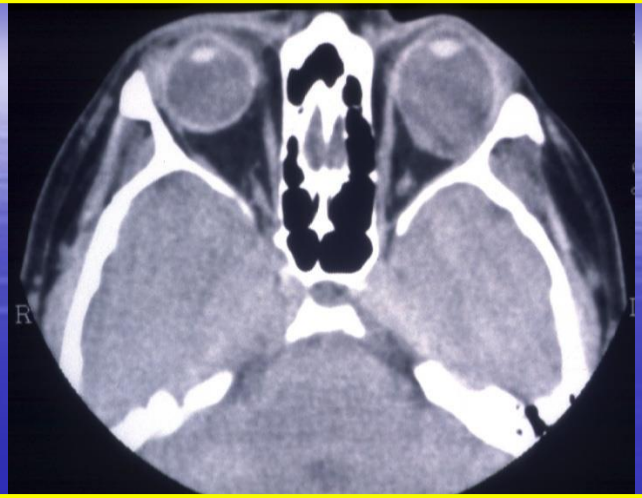
Fuchs spot



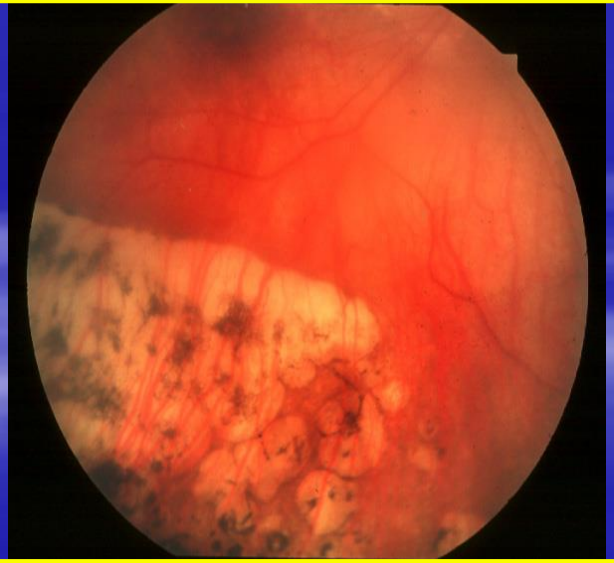
- Secondary pigment proliferation
- Follows absorption of blood

Other fundus changes in myopia

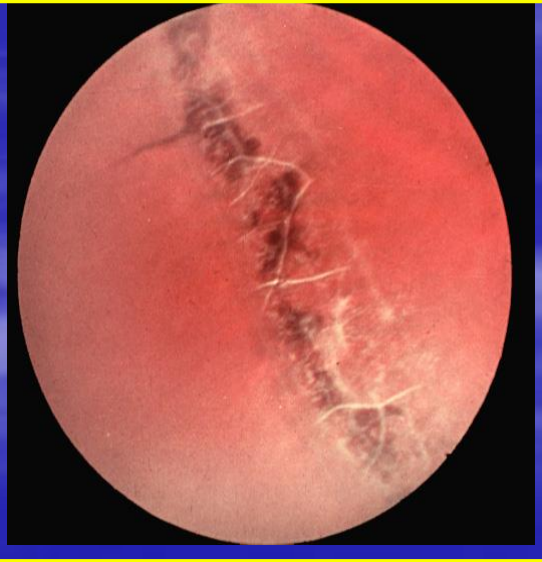
Tilted disc



Posterior staphylomas



Peripheral chorioretinal degeneration

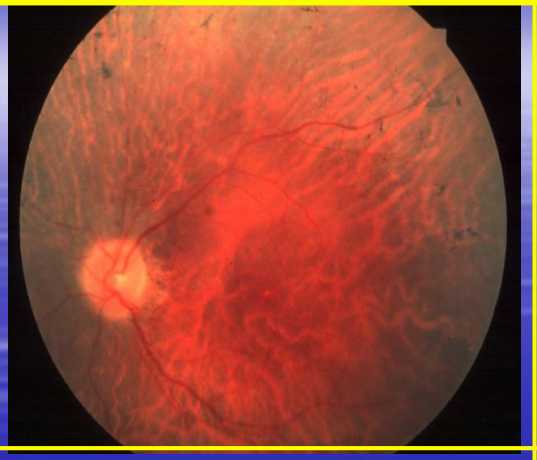


Lattice degeneration, holes and retinal detachment

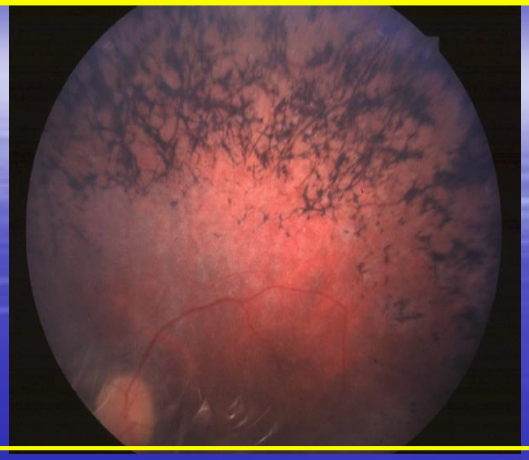
Retinitis Pigmentosa

1. **Inheritance**
   - Sporadic (23%)
   - Dominant (43%)
   - Recessive (20%)
   - X-linked recessive (8%)
   - Uncertain (6%)
2. **Presents** - usually prior to 30 years
3. **Prognosis** - dominant worst, x-linked best
4. **ERG** - reduced

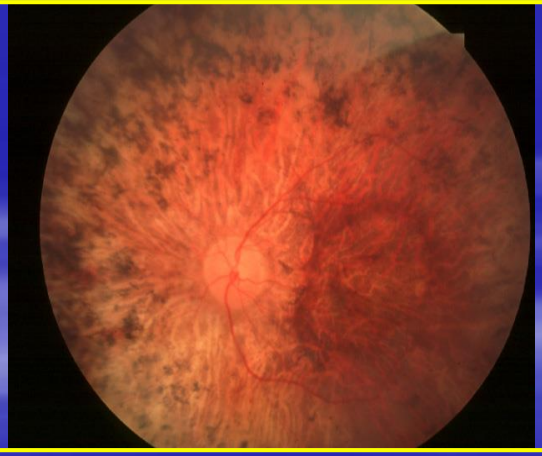
Progression of Retinitis Pigmentosa



- Fine dust-like pigmentation
- Arteriolar attenuation



- ‘Bone-spicule’ pigmentation



- Unmasking of large choroidal vessels

- Optic disc pallor
- Maculopathy

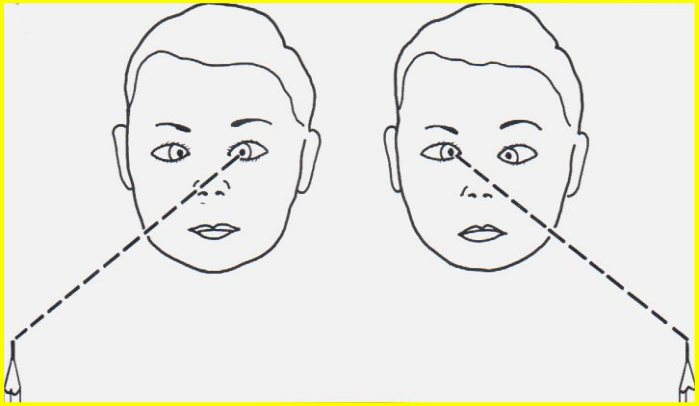
SQUINT

Essential infantile esotropia

Presents within first 6 months

Signs

- Angle large and stable
- Nystagmus in some cases
- Normal refraction for age
- Poor potential for BSV
- Amblyopia in about 30%



- Cross fixation

Management of essential infantile esotropia

- Correct amblyopia if present
- Surgery before age 12 months

- Bilateral medial rectus recessions

Constant exotropia

Congenital

- Presents at birth
- Large angle
- Alternating fixation
- Normal refraction for age

Sensory

- Disruption of binocular reflexes by acquired lesions, such as cataract

Consecutive - follows previous surgery for esotropia

Presentations of retinoblastoma

• Leukocoria - 60%

• Strabismus - 20%

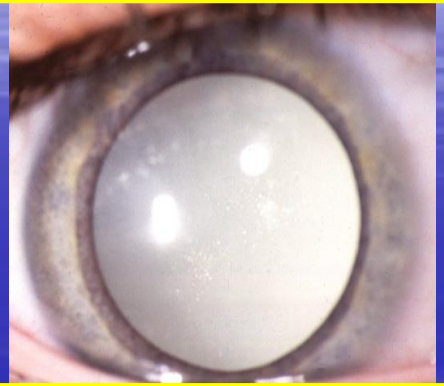
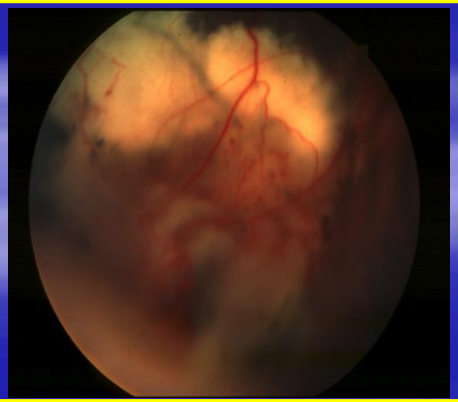
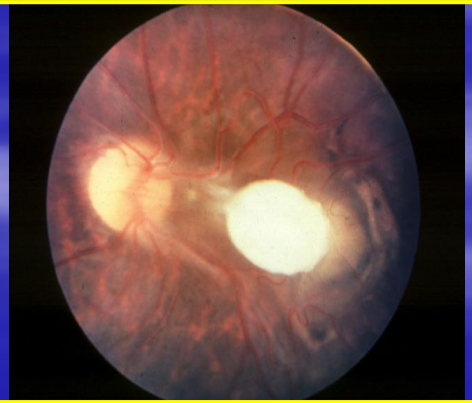
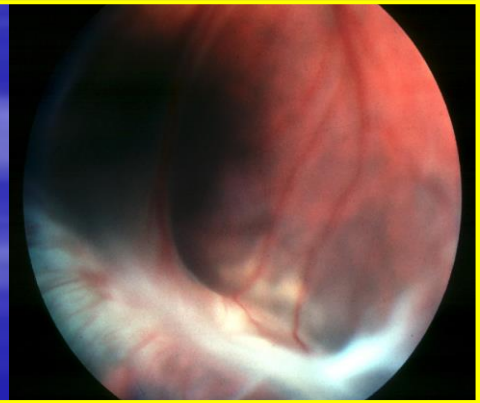
• Secondary glaucoma

• Anterior segment invasion

• Orbital inflammation

• Orbital invasion

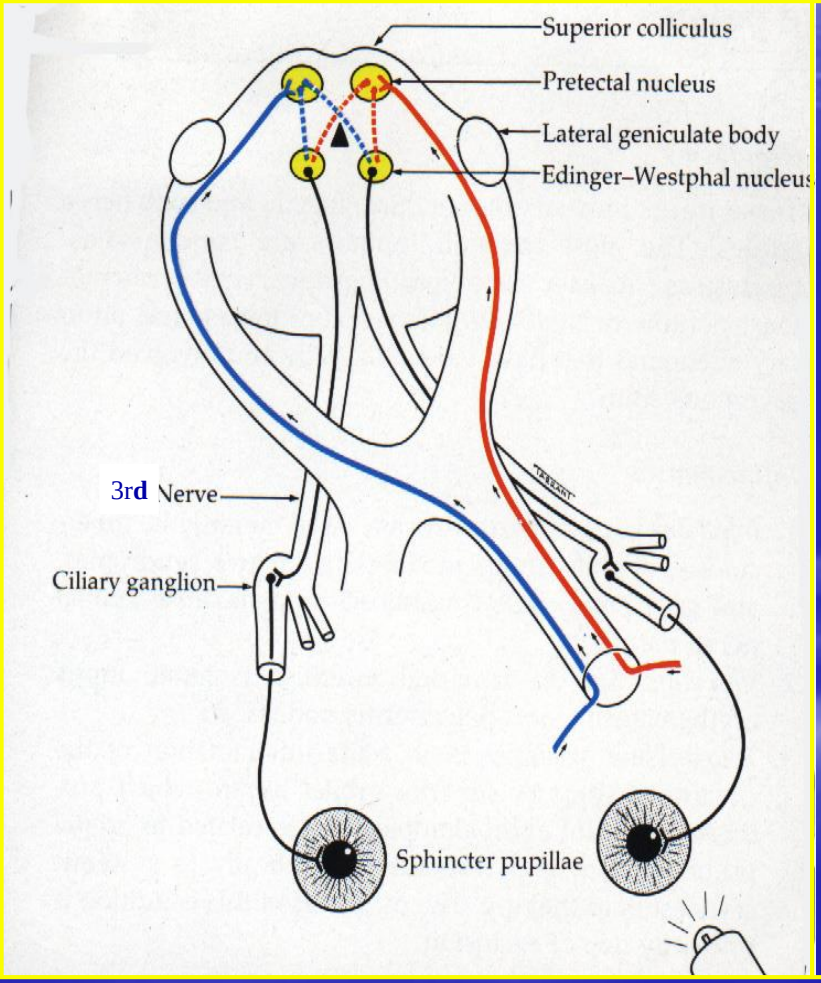
Differential diagnosis of leukocoria

Congenital cataract	Persistent hyperplastic primary vitreous	Inflammatory cyclitic membrane
		
Unilateral or bilateral	Unilateral	Unilateral or bilateral
Coats disease	**Posterior pole toxocara granuloma**	**Advanced retinopathy of prematurity**
		
Unilateral	Unilateral	Always bilateral but may be asymmetrical

NEURO-OPHTHALMOLOGY

Applied anatomy of afferent conduction defect

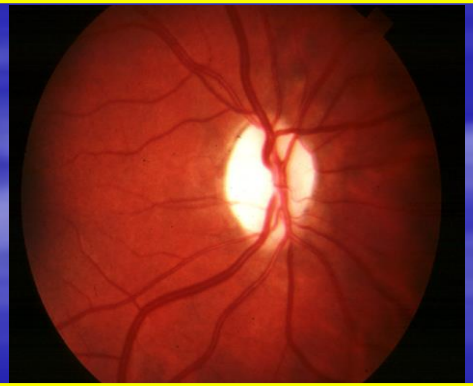
Anatomical pathway



Signs

- Equal pupil size
- Light reaction
  - ipsilateral direct is absent or diminished
  - consensual is normal
- Near reflex is normal in both eyes
- Total defect (no PL) = amaurotic pupil
- Relative defect = Marcus Gunn pupil

Optic disc changes

Normal	Swelling
• Retrobulbar neuritis • Early compression	• Papilloedema • Papillitis and neuroretinitis • AION
	Atrophy
	
	• Postneuritic • Compression • Hereditary optic atrophies

Superficial temporal arteritis

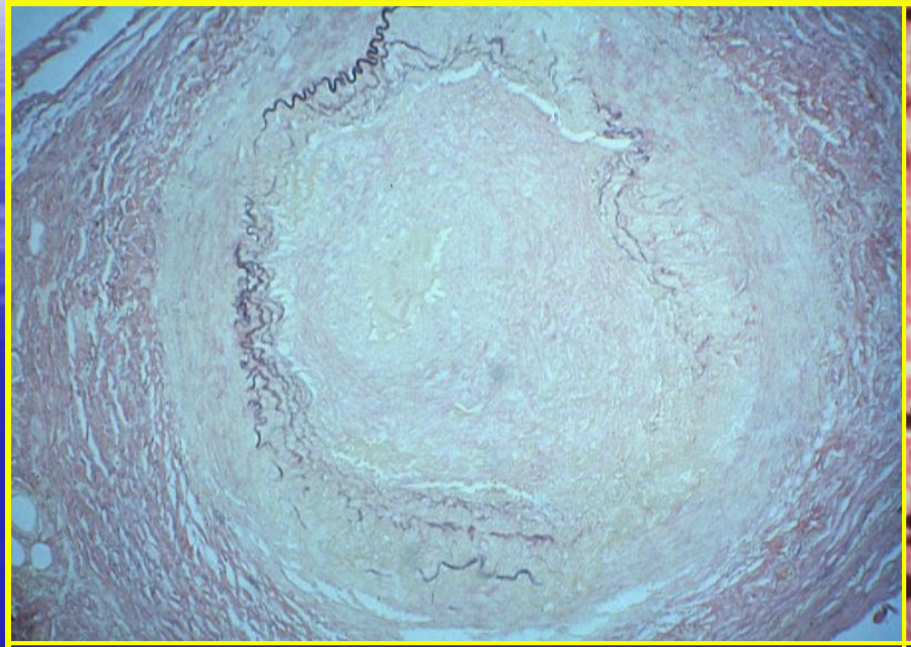
Presentation

- Age - 65-80 years
- Scalp tenderness
- Headache
- Jaw claudication
- Polymyalgia rheumatica
- Superficial temporal arteritis
- Acute visual loss

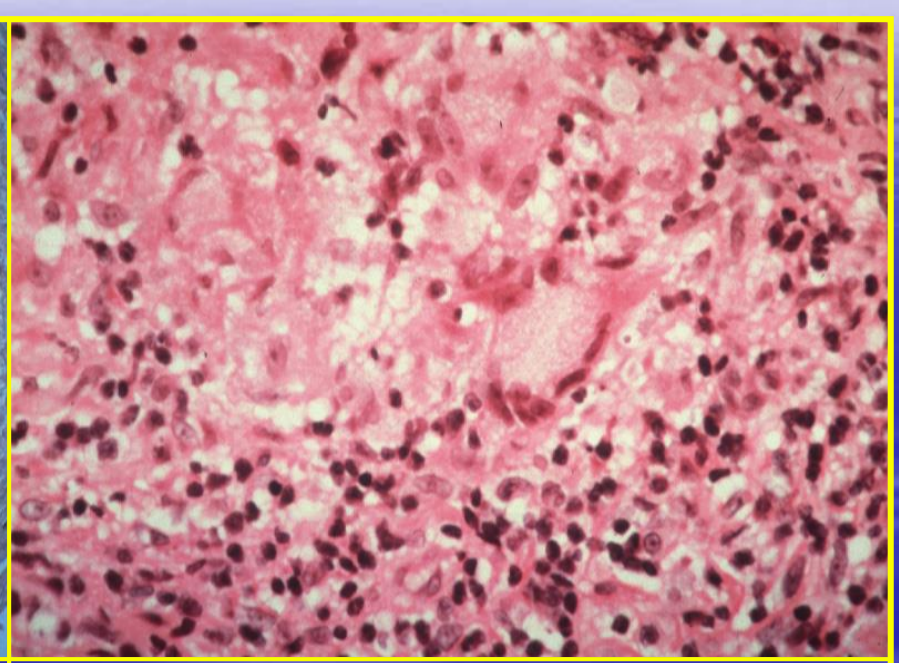
Special investigations

- ESR - often > 60, but normal in 20%
- C-reactive protein - always raised
- Temporal artery biopsy

Histology of giant cell arteritis



- Granulomatous cell infiltration
- Disruption of internal elastic lamina
- Proliferation of intima
- Occlusion of lumen



- High-magnification shows giant cells

Early Papilloedema

- VA - normal
- Mild disc hyperaemia
- Indistinct disc margins - initially nasal
- Mild venous engorgement
- Normal optic cup

Established Papilloedema (acute)

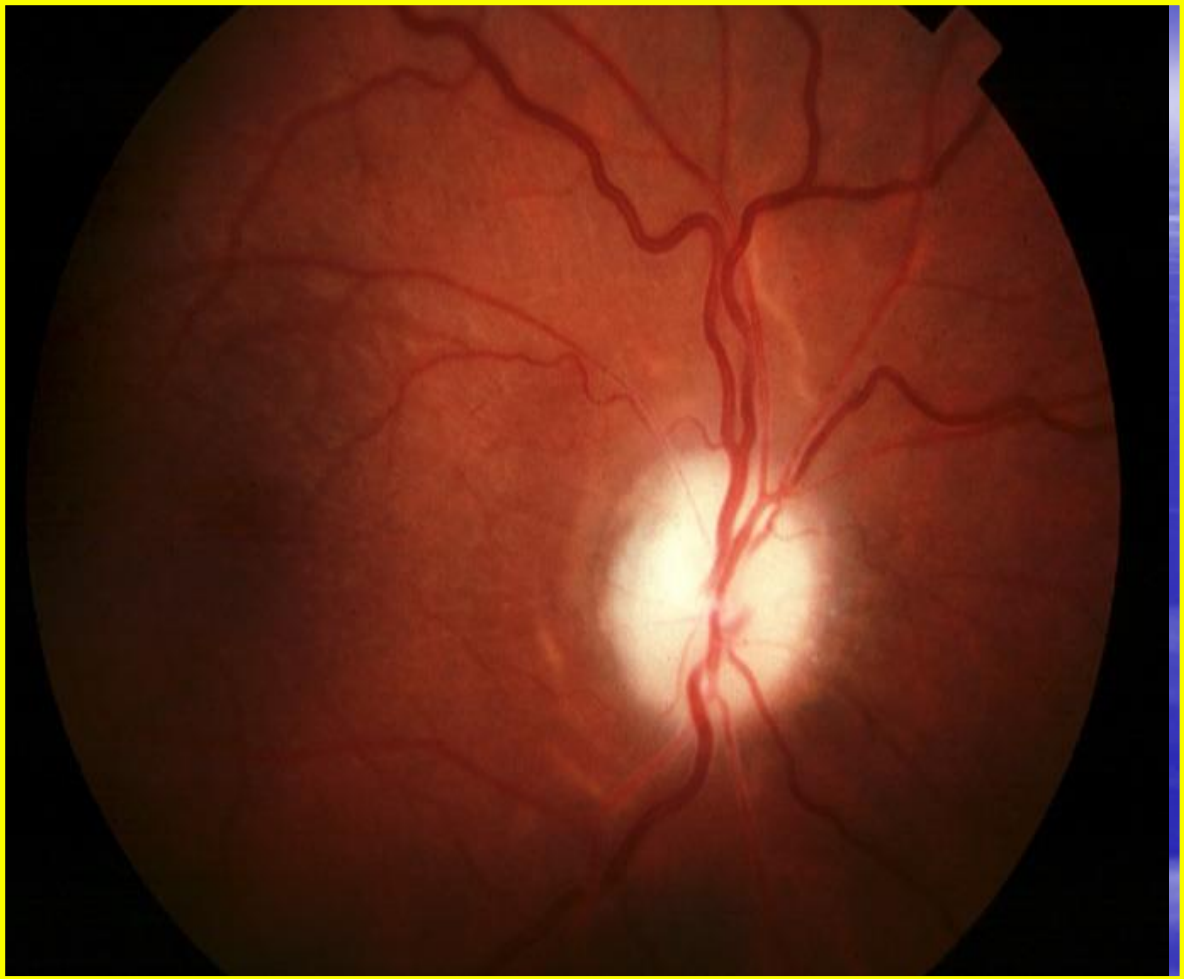
- VA - usually normal
- Severe disc elevation and hyperaemia
- Very indistinct disc margins
- Obscuration of small vessels on disc
- Marked venous engorgemenT

–

Longstanding Papilloedema (chronic)

- VA - variable
- Marked disc elevation but less hyperaemia
- Disc margins - indistinct
- Variable venous engorgement
- Absent optic cup

Atrophic papilloedema (secondary optic atrophy)



- VA - severely decreased
- Mild disc elevation
- Indistinct disc margins
- Disc pallor with few crossing vessels
- Absent optic cup

OCULAR TRAUMA

Orbital floor blow-out fracture

- Periocular ecchymosis and oedema
- Infraorbital nerve anaesthesia

- Ophthalmoplegia - typically in up- and down-gaze (double diplopia)

- Enophthalmos - if severe

Grading of severity of chemical injuries

Grade I (excellent prognosis)

- Clear cornea
- Limbal ischaemia - nil

Grade II (good prognosis)	Grade III (guarded prognosis)	Grade IV (very poor prognosis)
· Cornea hazy but visible iris details · Limbal ischaemia < 1/3	· No iris details · Limbal ischaemia – 1/3 to 1/2	· Opaque cornea · Limbal ischaemia > 1/2

Medical Treatment of Chemical Injuries

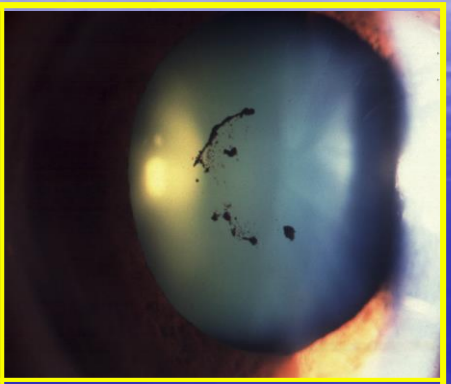
1. **Copious irrigation (15-30 min)** - to restore normal pH
2. **Topical steroids (first 7-10 days)** - to reduce inflammation
3. **Topical and systemic ascorbic acid** - to enhance collagen production
4. **Topical citric acid** - to inhibit neutrophil activity
5. **Topical and systemic tetracycline** - to inhibit collagenase and neutrophil activity

Anterior segment complications of blunt trauma

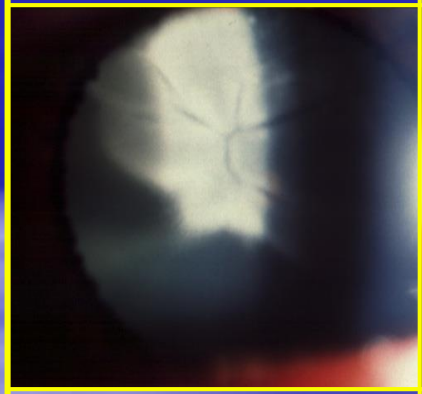
Hyphaema

Sphincter tear

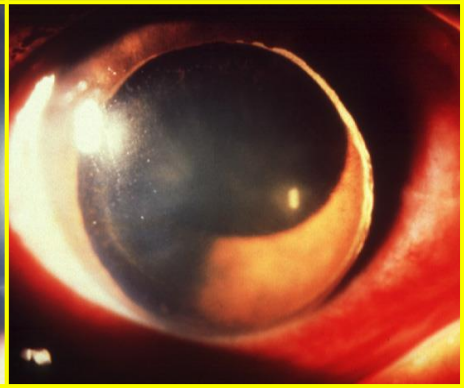
Iridodialysis



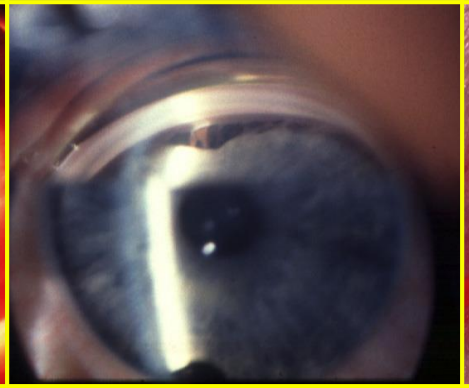
Vossius ring



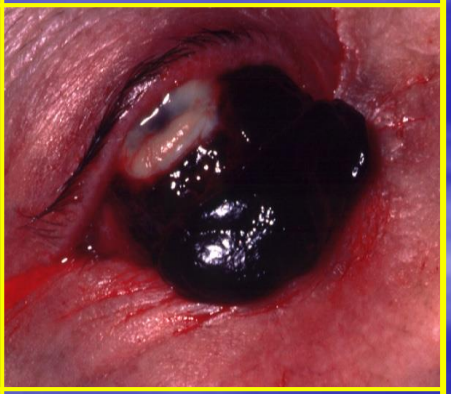
Cataract



Lens subluxation



Angle recession



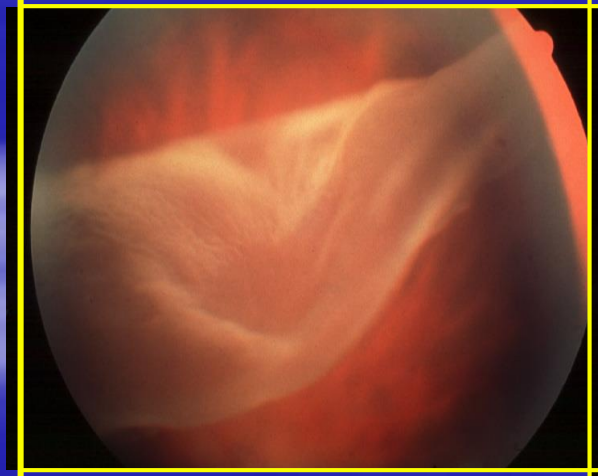
Rupture of globe

Posterior segment complications of blunt trauma

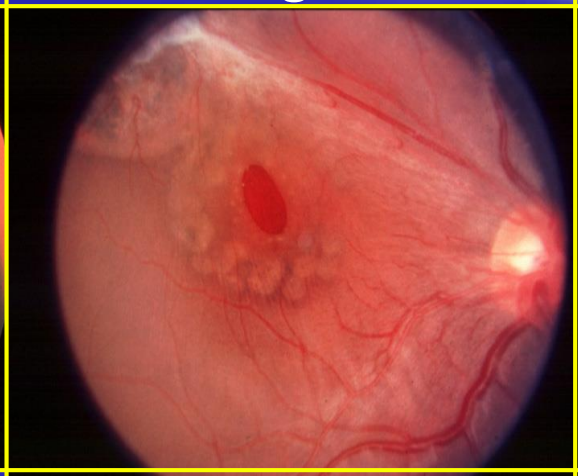
Commotio retinae

Choroidal rupture and haemorrhage

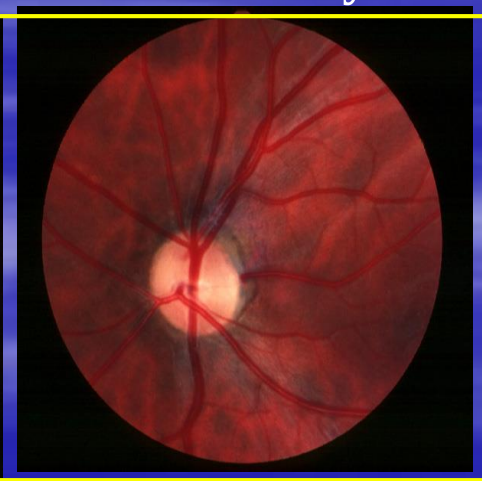
Avulsion of vitreous base and retinal dialysis



Equatorial tears

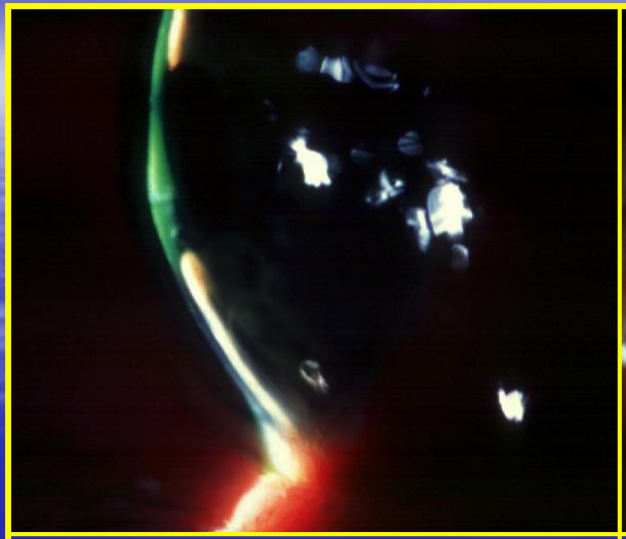


Macular hole



Optic neuropathy

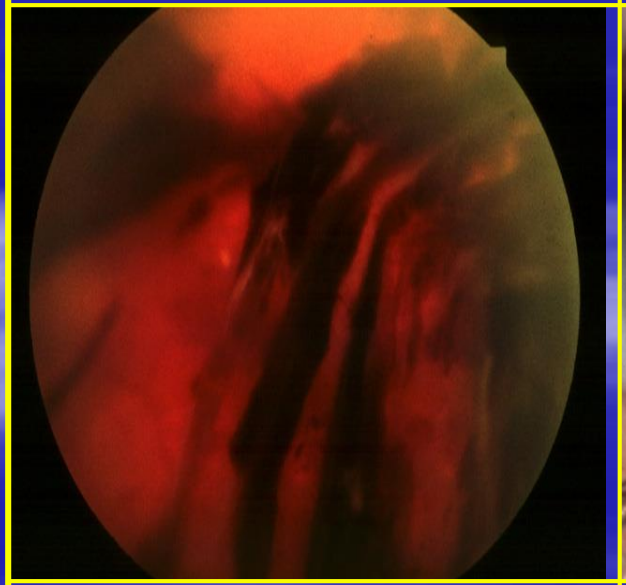
Complications of penetrating trauma



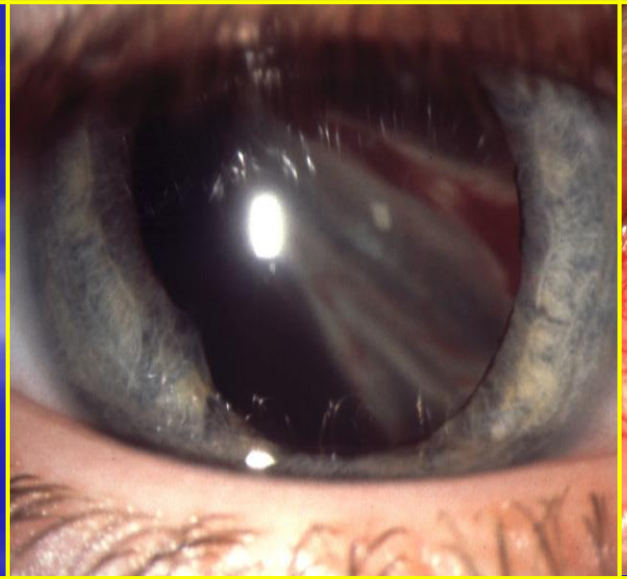
Flat anterior chamber

Uveal prolapse

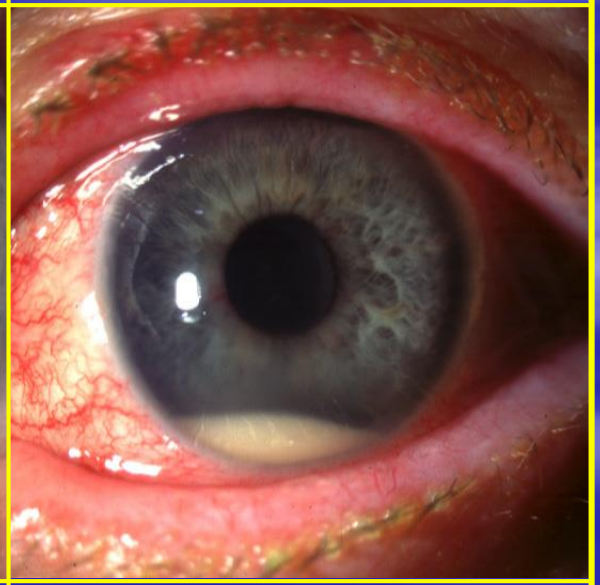
Damage to lens and iris



Vitreous haemorrhage



Tractional retinal detachment



Endophthalmitis

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Good Luck for all students